THE IRON AGE

Established 1855 — New York, May 12, 1910 — Vol. 85: No. 19

Published Every Thursday by the

DAVID WILLIAMS COMPANY

14-16 Park Place, New York

Entered at the New York Post Office, as Second Class Mail Matter.

Subscription Price, United States and Mexico, $5.00 per Annum; to Canada, $7.50 per Annum; to Other Foreign Countries, $10.00 per Annum. Single Copies, 20 Cents.

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Little Activity in Pig Iron

Further Western Buying of Bars—A Reduction in Wrought Iron Pipe—New Contracts for Furnace Coke

Activity in the iron market is not to be expected while the compulsory adjustment of pig iron supply to demand is under way. The movement has already gone far enough to modify some views recently expressed as to the low level likely to be reached. With costs advancing and prices receding, as has been the case for some time, it is at last recognized that they are hovering about the meeting point.

The United States Steel Corporation has been steadily adjusting its pig iron output to the demands of its steel works, and since the opening of the month has put out four furnaces and one or two more are ordered out. At Bessemer, Ala., it now has but one furnace making foundry iron, out of a group of five. The independent steel companies, being ordinarily buyers of pig iron, have not curtailed their own output in the same proportion as the leading interest. A number of merchant furnaces have gone out in the past week, including four in New Jersey and eastern Pennsylvania, one in central Pennsylvania, one in Virginia, one in the Shenango Valley and two in the Mahoning Valley.

Southern pig iron producers are making a firmer stand for $12, Birmingham, for No. 2 iron. Their costs are considerably higher than they were a year ago when their product touched $11. Two advances to coal miners and other labor have been made since, and recently most blast furnace workmen in the Birmingham district were advanced 6 per cent. when the Tennessee Company's new schedule went into effect.

More inquiry for foundry iron is reported from Cincinnati, though no market shows indications of a buying movement. Such offers as buyers are willing to make on round lots are not accepted by the furnaces.

In the Pittsburgh district sales of basic iron have been made at $15.25, and the floating supply of speculative iron is evidently not all taken up. In Bessemer iron following recent sales at concessions to steel companies in lots of 5000 tons, the market is reported somewhat steadier.

A good many coke contracts have been negotiated in the past week. One deal put through in the East is for 450,000 tons, deliveries extending over five years, on a sliding scale of prices. In the Pittsburgh district a 12 months' contract, beginning July 1, was made at $1.80, at ovens.

Under the conditions now confronting them furnacemen using Lake Superior ores are more restive under the advance of 50c a ton for this year's ore. While readjustment is not likely in the light of previous experiences of the sort, the carrying over of portions of this year's contracts to next year may be the outcome in some cases.

More agricultural works have contracted for bars, such transactions of the week in Central Western and Chicago district amounting to 40,000 tons, at 1.45c., Pittsburgh.

Structural steel has been more active in the West. For the Heisen Building, Chicago, the Cambria Steel Company will furnish 3000 tons. The American Bridge Company took 2600 tons of bridge work for the Rock Island. Keener competition has developed on both plain and fabricated material in the East, and the 1.50c., Pittsburgh, basis for steel has been shaded about $1 a ton.

Eastern plate mills are interested in the contracts taken at Camden, N. J., for two Chesapeake Bay freight and passenger steamers, and at Newport News for a tank steamer. The Panama lock gate work will not be let for some weeks.

The Bethlehem Steel Company took 5000 tons of rails for Panama last week. At the same time 14,000 tons of structural steel, sheets and pipe, was awarded the United States Steel Products Export Company.

The Harriman roads have begun placing the long pending car contracts. It is expected about 6000 will be given out now. Of these the Cambria Steel Company received 1325.

A reduction of $2 a ton has been made in wrought iron pipe.

Reducing Accident Litigation to a Minimum

The rapid headway voluntary plans of accident compensation are making may be a surprise to some manufacturers who have not been alive to this movement. But such have not appreciated apparently how powerfully the large fees of the accident claim lawyer and the high toll in other forms that litigation exacts from both employers and the injured employee have been working for the new way. As is well known, railroads have been greatly reducing the number of accident cases in which suit is brought. Recently the details were given in these columns of the voluntary plan for compensating the injured and relieving the families of those losing their lives in accidents adopted by the United States Steel Corporation. It was stated in that connection that the corporation disbursed about $1,000,000 in such relief and compensation last year, and would spend considerably more under the new arrangement. In its last bulletin the American Museum of Safety makes the interesting statement that because of the corporation's policy of basing compensation on the extent of the injury it had succeeded in greatly reducing the number of litigated accident cases. Out of about $1,000,000 spent last year by the corporation in compensation only about $40,000 was the result of lawsuits, or was obtained through lawyers. In some of the companies there was practically no resort to law. The following figures summarizing the accident records of the Steel Corporation's subsidiaries for the four years preceding 1909 are most suggestive:

	1905.	1906.	1907.	1908.
Av. number employed	172,933	169,619	191,815	162,134
Serious accidents....	3,361	4,816	4,659	4,960
Paid injured and families, &c.....	$630,889	$769,720	$1,054,615	$1,005,739
Total spent in accident matters.....	$796,617	$1,020,720	$1,336,256	$1,300,076
Judgments paid.....	$23,813	$41,536	$19,470	$41,265
Per cent. paid injured and families.	79.2	75.4	78.9	77.4
Percentage of accidents leading to suits...	4-10 of 1%	5-10 of 1%	4-10 of 1%	7-10 of 1%

The amount paid injured and their families includes also physicians' bills, and the "total spent in accident matters" takes in administration of accident prevention and adjustment, also inspections and other work in that direction. The percentage of cases in which suit was brought—only a fraction of 1 per cent. in any year—includes all accidents, serious and minor. The exhibit is impressive, and one that will give further stimulus to the efforts now being put forth to insure to the injured in industrial accidents a much larger average compensation than has ever been secured by litigation—and that without making any issue of the question of the negligence of the injured workman.

The Bessemer Steel Industry

The statistics of Bessemer steel production in 1909 give definite information concerning the further decline of the converter, as indicated earlier by the returns of Bessemer pig iron production last year. They show that for the first time Ohio produced more Bessemer steel than Pennsylvania, the figures being 3,466,077 and 2,845,602 gross tons, respectively; and that the percentage of Bessemer steel that was rolled into rails was the smallest in the history of the industry; they also make it quite safe to predict that acid Bessemer steel in the United States will not again reach the high record of 12,275,830 tons of ingots and castings in 1906, with nearly equal probability that it will not again rise to the total of 11,667,549 tons in 1907.

The Bessemer rail, unless the electric furnace shall come rapidly forward as an instrument for the economic production of high-grade rails in large tonnages, has entered upon a period of declining output, not only in percentage but in actual tonnage. In 30 years, with some ups and downs, from making up more than four-fifths of the Bessemer steel rolled in American mills, the Bessemer rail has come to be only about one-fifth of the total of converter steel. This great change has come through the marked development of other Bessemer rolled products, but has been emphasized in the past two years by the displacement of the Bessemer process by the open hearth for rail steel. In making the table below, which shows this decline, we have given the statistics by five-year periods from 1880 to 1905 and then by years. Strictly the comparison should be between Bessemer rail ingots and total ingots and castings, but finished rails are the only form in which Bessemer rail steel is statistically stated:

Production of Bessemer Ingots and Castings and Bessemer Rails in the United States.—Gross Tons.

	Bessemer Ingots and Castings.	Bessemer Rails.	Per cent. Rails.
1880	1,074,261	852,196	79
1885	1,519,430	959,471	63
1890	3,688,871	1,867,837	50
1895	4,909,128	1,299,628	26
1900	6,684,770	2,383,654	35
1905	10,941,375	3,192,347	29
1906	12,275,830	3,791,459	31
1907	11,667,549	3,380,025	29
1908	6,116,755	1,354,236	22
1909	9,330,783	1,806,621	19

The table shows that, while the falling off in rails is the chief factor in the decline of the Bessemer steel industry in recent years, this does not entirely account for it. Last year's output of other Bessemer products makes a favorable comparison, however, with so recent a year as 1905. Adding, say, 11 per cent. to the rail output to get the rail ingot total (on the basis of 10 per cent. loss from cropping) and deducting from the Bessemer total, we have 7,343,500 tons as the

amount of Bessemer steel that went into other products than rails in 1909, as against 7,407,691 tons in 1905. Similarly we find that the average for 1906 and 1907 of Bessemer steel ingots which were rolled into forms other than rails was 7,994,481 tons. Thus there has been some loss from the Bessemer to the open hearth process in products apart from rails, but it is comparatively small. The fact that Ohio took the lead last year in Bessemer production shows that in wire, wrought pipe, sheets, tin plates and bars, into which the Bessemer steel produced at Cleveland, Lorain, Youngstown and Columbus largely enters, the converter is still an important factor.

The "baby" Bessemer does not figure in the statistics to the extent that might be expected in view of the number of plants installed in recent years. The production of Bessemer steel castings last year was 33,814 gross tons, and all but 821 tons was blown in small converters. The output was 20,559 tons in 1908, 33,273 tons in 1907, 32,601 tons in 1906 and 22,103 tons in 1905. Last year showed a small increase over the average for 1906 and 1907, and 1910 will show more, as 10 small converters were being built at the close of 1909. Last year 18 Tropenas and 15 other small converter plants were operated.

The United States Steel Corporation, through the development of Gary, with its large output of open hearth rails, and the consequent decline of the Edgar Thomson Bessemer rail mill, produced a smaller percentage of the country's Bessemer steel in 1909 than in any preceding year, or 62.9 per cent. This compares with 66.3 per cent. in 1908, 64.8 per cent. in 1907 and 65.7 per cent. in 1906.

The American Iron and Steel Association in its statistical statement concerning new Bessemer converter construction says that only two standard converters were building at the close of 1909, and these are to be used for desiliconizing and decarburizing molten metal for open hearth furnaces. Thus the converter, where it is not being crowded out by the open hearth furnace, is more and more earning its right to remain by becoming the useful servant of its lusty rival.

International Peace

The movement for placing international peace upon an authoritative basis, which was referred to in *The Iron Age* of April 28, has received a considerable impetus from the speech of ex-President Roosevelt at Christiania. Mr. Roosevelt in his remarks proposed substantially the means suggested in the Bartholdt joint resolution as being the indispensable requisite for the stability of any peace agreement. This requisite is the establishment of a sufficient force under the control of the central authority, whatever that may be, to give effect to its decrees and to render impossible the beginnings of war. On Saturday last the Foreign Affairs Committee of the House of Representatives accorded a hearing upon the Bartholdt resolution, the reports of which hearing indicate that the committee is distinctly interested in the subject.

It does seem as though the continued educational work of peace societies and peace advocates might now be supplemented by some practical action. The nations have been taught by the most efficient of all schoolmasters, namely experience, the wholly uncompensated disadvantages of war and the intolerable burdens imposed upon them not merely by hostilities themselves, but by the preparedness which it is necessary to maintain and by war's aftermath in the form of indemnities, pensions and the like. They should be, and doubtless are, ready now for wise and efficient leadership into the permanent paths of peace, and there seems good reason to hope that this latest movement will not be suffered to die out, especially if it is to receive the active support of so forceful a personality as our former President.

At this stage of the movement for securing the abolition of war two features stand out prominently. One is the awakened interest of men of affairs and general business man and the other is the crystallization of sentiment in favor of a practical method for the complete suppression of war. The advocacy of peace apparently made slow progress when confined to those who were merely considered dreamers and idealists, though conceded to be influenced by the highest possible motive, that of doing good to their fellowmen. But the cause has now been taken up, and is being forcefully prosecuted by men who have shown themselves leaders in great industries and general business affairs. The man of theories and high ideals can educate, but it remains for the practical man to convert thought into action. This is the stage to which we have now arrived. The practical men have a following that cannot fail to bring about success. The plan for securing international peace which they have evolved commends itself as eminently suited to the accomplishment of its purpose. It leaves every nation free to manage its internal affairs and work out its own destiny while insuring it from attack by a more powerful neighbor or by a combination of enemies. Its resources can be wholly applied for its own development and for the material welfare of its own people instead of being wasted in war or in preparation for war. The Bartholdt joint resolution or a measure similar in purport should be adopted by Congress so that action can speedily be started toward securing the establishment of some central authority in which will be vested the responsibility of maintaining international peace. As Mr. Roosevelt says, "it would be a master stroke if those great powers honestly bent on peace would form a League of Peace, not only to keep the peace among themselves, but to prevent, by force if necessary, its being broken by others."

A Profitable Toolroom

That the toolroom is a very important arm of any manufacturing establishment is sufficiently proved by the many articles which have appeared discussing its organization, methods and conduct. It has been shown time and again that successful manufacturing depends to a great extent on the perfection of the tools used in turning out the product, which is as much as saying that it depends on the mechanical skill and ability represented by the toolroom organization.

While in many concerns the toolroom does not attain any degree of magnitude, in others the toolroom payroll and expense account run up yearly into the hundred thousands, and it then becomes, in proportion, a source of either congratulation or menace as the case may be. Now no wide-awake concern will deliberately agree to accept orders and undertake the manufacture of goods amounting to several hundred thousand dol-

lars a year unless there is a profit in the transaction. Moreover, a good superintendent is not satisfied if any of his manufacturing rooms are shown to be operating at a loss or even without profit. Hence, when the toolroom assumes the size of even the least of the manufacturing rooms, it should at once, if it had not already done so, attract the same attention from the superintendent as he is wont to give his other rooms. He should consider it just as vitally important for the toolroom to show a profit on the investment represented as for his buffing room or his cutting-up room.

Some will insist, with a shrug of the shoulders, that the toolroom is a sort of "necessary evil," an "old man of the sea," which will ever cling about us, clogging our movements and hampering our progress; yet to-day the country is full of concerns that make it their only business, and they pay good dividends, too, to turn out tools for other people.

Of course, the first step in ascertaining whether the toolroom is a parasite or a root, is to keep accurate tool costs, a thing which is to-day by no means difficult. The second step is to see to it that all tools are charged out at a price which is sufficiently above the cost to mean a profit. For example, the product of a toolroom which costs $300,000 a year should show a total charge price of at least $330,000, with the assumption that a 10 per cent. profit is to be attained. Ten per cent. is little enough.

Try keeping such records for a year. If, at the end of 12 months, your books do not show you a profit on your tools, then one of two things is true and, bitter as the pill may be, the manager must believe either that his tools are costing too much or that his salesmanship is lacking. Usually it will prove to be the excessive tool cost rather than the salesmanship; the price of the goods themselves is all right, but the customer baulks at the tool item—he can't see his way clear to paying so much. "So and so will make the tools for so and so much less." At any rate, make up your mind that your toolroom shall pay, or help to pay, dividends; let it be a matter of pride that not one department or room in your shop is running at a loss.

Correspondence

Protecting Plates for Blast Furnace Linings

To the Editor: My attention has been called to the notice, in your issue of April 14, of Mr. Cook's plan for protecting blast furnace linings against wear from the material near the stock line. I have no doubt the plan will be perfectly successful.

It is proper to call attention to the fact that in 1903 or 1904 very good results were obtained at Longdale, Va., at the suggestion of J. E. Johnson, Jr., by using angle plates bent from 6 in. x ¾ in. wrought iron bars in place of the unsatisfactory cast iron angle plates previously used. The iron was bought sheared to length and then easily bent to shape in the smithshop. In 1905, on my advice. the same method was used at the Johnson City, Tenn., furnace, and about the same time I mentioned it to J. S. Kennedy of Stanhope, N. J., who has used it there, as I understand, with very satisfactory results. F. FIRMSTONE.

EASTON, PA., May 7, 1910.

The international Acheson Graphite Company, Niagara Falls, N. Y., has established branch offices at room 511 West Street Building, New York; room 457 Monadnock Block, Chicago, and 309 Fourth avenue, Pittsburgh. It is expected that the company's interests in each locality mentioned will thus be much more thoroughly cared for.

The American Electrochemical Society

Seventeenth General Meeting, Held at Pittsburgh

A four-day session of the American Electrochemical Society was held in the Fort Pitt Hotel and in the University Building, Pittsburgh, May 4 to 7. The meeting was largely attended. Among those present was Paul L. T. Heroult, inventor of the electric steel furnace bearing his name, one of which is in operation at the American Steel & Wire Company's plant at Worcester, Mass., another at the Illinois Steel Company's South Chicago plant, a third is being operated by the Firth-Sterling Steel Company at Duquesne, Pa., and a five-ton furnace is about to be installed in the Park Works of the Crucible Steel Company in Pittsburgh.

A large number of papers were read at the different sessions and excursions were made to many of the manufacturing plants in the Pittsburgh district, including the works of the Firth-Sterling Steel Company, where the 2½-ton Heroult furnace was seen in operation; the Isabella blast furnaces of the Carnegie Steel Company at Etna, Pa., where the Gayley dry blast system was inspected, also the Homestead Works of the Carnegie Steel Company, and the works of the Westinghouse Electric & Mfg. Company at East Pittsburgh. At the Homestead Works the visitors were unable to see the electric steel furnace installed some time ago, as it is not now in operation, some changes being in progress.

The convention closed with a public meeting at the Carnegie Music Hall on Saturday afternoon, at which the principal speakers were Dr. John A. Brashear, who spoke on "The Advantages of Pittsburgh as an Electrochemical Center"; Dr. John H. Finney of the Southern Appalachian Conservation Commission, whose address was on "The Conservation and Utilization of Nature's Power," and Dr. J. W. Richards of Lehigh University, secretary of the society, whose subject was "The Present Status of the Electrochemical Industries." Officers were elected for the ensuing year, as follows:

President, Dr. W. H. Walker, Massachusetts Institute of Technology, Boston; vice-presidents, E. F. Roeber, New York; S. S. Sadler, Philadelphia; L. Kahlenberg, Madison, Wis.; treasurer, P. G. Salom, Philadelphia (re-elected); secretary, Dr. J. W. Richards, South Bethlehem, Pa. (re-elected); managers, C. F. Burgess, Madison, Wis.; C. P. Townsend, Washington, D. C.; W. R. Whitney, Schenectady, N. Y.

The register showed an attendance of over 500 members. The secretary's report, delivered at the opening session, showed that the membership of the society had passed the thousand mark. A year ago the total members in good standing were 776; during the year 343 new members were added, while 53 were lost during the year, through deaths, resignations or other causes, giving a net gain in membership for the year of 290, or a total membership at this time of 1066.

The Stark Rolling Mill Company, Canton, Ohio, is issuing printed matter calling attention to the alumaloyd sheets which it manufactures. These are special analysis sheets, coated with aluminum alloyed meal. They are particularly adapted to use for automobile bodies, being absolutely rustless and having a perfectly smooth paint-absorbing surface. The use of these sheets makes it possible to finish a part or body with a primer, a one-color coat, a rubbing and a finishing varnish. To meet the heavy demand the company is planning to increase its capacity and output.

Canada's Wire Rod Bounty

To Be Discontinued After June 30, 1911

TORONTO, May 7, 1910.—In Parliament recently Mr. Fielding, Canadian Minister of Finance, gave notice of the following resolution:

That it is expedient to provide that no bounties shall be payable in respect to rolled round wire rods after June 30, 1911, under the provisions of the act of 1907 respecting bounties on iron and steel, except on such rods as may have been otherwise entitled to payment of bounties, and which were on or before the said date sold to wire manufacturers for use or used in making wire by the makers of such rods in their own factories in Canada.

This resolution was adopted in the House of Commons May 2. James Conmee, representing Thunder Bay and Rainy River and supporting the Government, expressed the hope that when the iron and steel duties are rearranged a differential in favor of the products of Canadian ore will be provided. He would advise that all Canadian companies manufacturing iron and steel be required to use domestic ore as a condition of Government protection. He did not indicate the means by which this idea could be made practicable if bounties are abandoned. He also urged that subsidized railroads be compelled to use rails made from Canadian ore. In reply to the question of another member, the Finance Minister said that the Government has no present intention to impose on iron and steel additional duties equal in fostering effect to the bounties that are to expire this year, but added: "I have no doubt it will be a matter for consideration in the future, but the future must take care of itself." This answer has led some who are watching the development of the steel industry to harbor the expectation that there will be a readjustment of the duties next session, and that it will be favorable to the manufacturers of iron and steel.

Of the forms of iron and steel whose production is assisted by Government bounties, wire rods alone are subject to no restriction by the terms of the act in the matter of the duration of the bounty and to no variation in the amount. The bounty on pig iron, the bounty on puddled bars and the bounty on crude steel taper off by annual declension until they reach the vanishing point at the end of the current calendar year. To put an end to them no further action of Parliament is required, but the subsection relating to wire rods will remain in force until it is specifically repealed by act of Parliament. It is as follows:

In respect of rolled round wire rods not over ⅜ in. in diameter, manufactured in Canada from steel produced in Canada from ingredients of which not less than 50 per cent. of the weight thereof consists of pig iron made in Canada, when sold to wire manufacturers for use or when used in making wire in their own factories in Canada, on such wire rods made after the thirty-first day of December, 1906, $6 per ton.

The rate has been $6 a ton ever since this bounty was established. Among those who were aware of its exceptional nature there was some curiosity to know whether or not the Government would ask Parliament this session to terminate it. Mr. Fielding's resolution is not a bill, but it indicates clearly enough the intention of the Government to put an end to the bounty. As the House of Commons has adopted the resolution a bill based upon it will be introduced and passed through Parliament. It is not a certainty that such a bill will be forthcoming this session, which is now within two or three days of its close, but by now introducing and pushing through the resolution the Government gives fair notice to the manufacturers concerned. They will expect the bill to follow and become an act next session, and they have 14 months in which to prepare for the discontinuance of the bounty. After June 30, 1911, no bounties will be paid on wire rods except upon such as on or before that date were sold for use by wire makers in Canada. It would not be surprising if the output of the rod mills in the period up to the middle of 1911 would be very large, as there will naturally be a desire to get as much as possible of the remaining benefit of the bounty. So long as the rods are disposed of for wire making purposes before the end of June, 1911, they will be entitled to the bounty, even though claim for it could not well be made until after that date.

The Hamilton Steel & Iron Company has under consideration a proposal to install a wire rod mill. It remains to be seen whether the Government's present action will cause any change in this part of the company's plans.

Wire rods are on Canada's free list. So is barbed fencing wire. Flat steel wire when imported by manufacturers of buckthorn and plain strip fencing is also nondutiable. Buckthorn strip fencing, however, is dutiable at 15 per cent. under the general tariff. Galvanized iron and steel wire, Nos. 9, 12 and 13 gauge, is free. Steel wire valued at not less than 2¼ cents per pound, when imported for use exclusively in the manufacture of wire rope, is free. It is felt that if the bounty is removed wire rods and some of the descriptions of wire that are now on the free list should be made dutiable. To make these compensatory changes, however, would be unpopular with the farmers, who are now becoming predominant in the politics of the country. C. A. C. J.

The Bayonne Steel Casting Company

The Bayonne Steel Casting Company, whose main office is at 30 Church street, New York, has purchased a site at Bayonne, N. J., immediately adjoining the property of the Babcock & Wilcox Company, and will at once proceed to erect a plant for the manufacture of steel castings. The site was selected after exceedingly careful consideration. The location enables the company to have shipping facilities on three railroads and by water, it being within the free lighterage district of the harbor of New York. As a daily line of steamers to harbor points will run from the wharf on the Kill von Kull, the company expects to make a specialty of supplying with steel castings the shipbuilding and dry dock concerns round New York harbor. The equipment of the plant will include motor trucks for the delivery of castings where they may be urgently needed in the vicinity.

The company will make converter steel exclusively, and will equip its foundry to take care of railroad, shipbuilding and miscellaneous machinery steel castings, but will probably make a principal specialty of electrical steel castings. It expects to turn out from 400 to 500 tons per month of small and moderate sized castings. It will probably have the largest production of converter steel castings of any foundry in the United States. The main foundry building will have 30,000 sq. ft. of molding floor. Other buildings of ample proportions will be erected for cleaning, sand blasting, pattern storage, &c. As the site comprises 5 acres, there will be considerable room for expansion. It is hoped to have the plant ready for operation early in August.

The organizers of the company are men well known in the steel casting business, all of them having been identified with the industry for a great many years. The president is William D. Sargent, president of the Q M S and Reading Steel Castings Company; the vice-president is J. Turner Moore, vice-president of the Reading Steel Castings Company; the secretary and treasurer is D. W. Yeckley, also of the Reading Steel Castings Company. The company will be managed by A. E. Williamson, formerly secretary and sales manager of the New Jersey Steel Company, Rahway, N. J. The works manager will be C. E. Chapple, formerly assistant to A. W. McArthur, president of the New Jersey Steel Company.

Pacific Coast Metal Trades Association

The United Metal Trades Association of the Pacific Coast held its annual meeting at the Commercial Club, Portland, Ore., April 22 and 23. About two-thirds of the firms in the association were represented by from one to three members each, making the attendance the largest in the association's history. Reports were presented showing that the organization is in good condition financially and otherwise. The forenoon of the first day was devoted to the reports of the offices and the discussion of questions raised therein. In the afternoon the members visited the shops of Portland and were taken about the city in automobiles. Similar trips were made on the second afternoon. The election of officers resulted in the choice of the following:

President, George James, Variety Iron Works, Seattle.

First Vice-President, W. H. Corbett, Willamette Iron & Steel Works, Portland.

Second Vice-President, Gilbert Hunt, Gilbert Hunt Company, Walla Walla, Wash.

Third Vice-President, John L. Roberts, Puget Sound Iron & Steel Works, Tacoma, Wash.

Treasurer, H. S. Hastings, Independent Foundry Company, Portland, Ore.

The annual banquet was held at the Commercial Club Saturday evening, April 23, and was attended by 62 members and guests. Addresses were made by T. B. Sumner and J. Bruce Gibson, president and secretary respectively of the Sumner Iron Works, Everett, Wash.; W. H. Corbett, H. S. Hastings, President Banfield of the Employers' Association of Oregon, Portland; Charles G. Gunn, manager Columbia Steel Company, Portland and San Francisco; J. V. Paterson, manager Moran Company, Seattle; J. T. Heffernan, manager Heffernan Engine Works, Seattle, and Principal Hamilton of the Portland Trade School.

The Lynchburg Foundry Company to Build Another Pipe Plant.

The Lynchburg Foundry Company, Lynchburg, Va., announces its intention to proceed vigorously with the building of its new cast iron pipe plant at Norfolk, Va., the announcement of which was made over a year ago. R. C. McWane, sales manager, 220 Broadway, New York, states that the plans for the new establishment had been held in abeyance until the company was assured of an abundance of raw material at first hands. This has been arranged for through the recent purchase by the Lynchburg Foundry Company of the Woodstock iron properties at Anniston, Ala., comprising two blast furnaces, which are to be operated under the name of the Anniston Iron Corporation. It had been considered desirable to await this development before proceeding to greatly increase the production of cast iron pipe.

Mr. McWane states that the general plan of the Norfolk works will be a modification of the latest German type of pipe foundry in combination with a number of proved methods of the Lynchburg Foundry Company, the essential departure from the conventional type being the elimination of pits. This will enable the plant to be more quickly completed than would be the case if the design of the company's Lynchburg and Radford plants was adhered to. In any event, however, the new plant will scarcely be in operation this year. It is considered extremely desirable not to make haste at the expense of thoroughness in the planning and building.

Crucible Steel Company Improvements.—The Crucible Steel Company of America, Henry W. Oliver Building, Pittsburgh, has placed a contract for the building of a Heroult five-ton electric furnace and also a contract for a 40-ton tilting open hearth furnace, both to be installed in its Atha Works, at Illingworth, N. J. The company has also placed a contract for the complete remodeling of the open hearth plant at its Crescent Works in Pittsburgh. This plant now contains two 25-ton stationary open hearth furnaces and a small tilting furnace. The latter furnace will be removed and a 25-ton stationary open hearth furnace built in its place. The open hearth building will be extended and electric chargers and other new modern equipment installed. At its Park Works, in Pittsburgh, the company is building two new 20-in. sheet mills, which, with its other mills, will give a total capacity of 500 tons of sheets per month. It rolls as light as 28 gauge.

The National Machine Tool Builders' Association

The programme of the convention of the National Machine Tool Builders' Association, to be held at Rochester, N. Y., Tuesday and Wednesday, May 24 and 25, has been prepared by Charles E. Hildreth, the secretary, and promises most interesting as well as educational sessions. They will be held at Hotel Seneca. The feature of the entertainment will be a reception given Tuesday evening by Miss Kate Gleason, head of the Gleason Works, Rochester, at her Spanish castle, a beautiful suburban estate, recently completed. The convention programme in detail follows:

First Session, Tuesday Morning.

Committee reports:

Motor Committee, Standardization of Motors, P. A. Montanus, chairman.

Uniform Costs, Results of installation, E. J. Kearney, Kearney & Trecker Company, Milwaukee, Wis.

Apprenticeship Committee, E. P. Bullard, Jr., chairman; F. L. Eberhardt, speaker.

Tariff Committee, J. B. Doan.

Second Session, Tuesday Afternoon.

Meetings of the various machine tool committees.

Third Session, Wednesday Morning.

Cincinnati Continuation School, illustrated, Prof. F. B. Dyer, Superintendent of Schools, Cincinnati.

Cancellation of Orders, C. Wood Walter, C. A. Johnson, Murray E. Shipley and William H. Reid, Marshall & Huschart Machinery Company, Chicago.

Future of the Automobile Business with Reference to Machine Tools, Robert Pierpont, works manager of the Olds Motor Works, Detroit.

Cone Drive, R. K. Le Blond, *vs.* Gear Drive, William Lodge.

A Bill to Create a Patent Court of Appeals, W. R. Wood, Cincinnati.

Fourth Session, Wednesday Afternoon.

Direct Advertising, A. H. Hitchcock, *vs.* Trade Paper Advertising, John A. Hill.

Gas Engines for Blowing Blast Furnaces

The American Steel & Wire Company has awarded a contract to the Allis-Chalmers Company, Milwaukee, Wis., for two gas engine blowing units for its Central Furnace plant at Cleveland, Ohio. These engines will have a maximum capacity of 5000 hp. each and will be the largest gas engines so far undertaken in this country. This is the sixteenth consecutive order received from the United States Steel Corporation by the Allis-Chalmers Company and makes a total of 50 large gas engines sold by the latter to the former. The records of the 25 engines installed at Gary have been carefully watched, both by the engineers of the Steel Corporation and by gas power experts from all over the world, with the result that successive purchases of units of the same build are now being made. The engines ordered by the American Steel & Wire Company, which will make seven in operation at its plants, are of the twin-tandem, double-acting, four-cycle, horizontal type, with gas cylinders 44 in. in diameter and 60-in. stroke. They will operate on blast furnace gas. The blowing tubs are of the Slick type and are 80 in. in diameter. They will deliver 40,000 cu. ft. of free air per min.

The Iron and Metal Markets

A Comparison of Prices

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	May 11, 1910.	May 4, 1910.	Apr. 13, 1910.	May 12, 1909.
PIG IRON, Per Gross Ton:				
Foundry No. 2, standard, Philadelphia	*$17.00*	$17.00	$17.75	$16.00
Foundry No. 2, Southern, Cincinnati	15.25	15.25	15.25	14.50
Foundry No. 2, local, Chicago	*17.00*	17.25	17.50	16.50
Basic, delivered, eastern Pa.	*17.00*	17.00	17.50	15.00
Basic, Valley furnace	*15.25*	15.50	16.00	14.25
Bessemer, Pittsburgh	*17.90*	17.90	18.40	15.90
Gray forge, Pittsburgh	*15.90*	15.90	16.15	14.40
Lake Superior charcoal, Chicago	*18.50*	19.00	19.00	19.50
BILLETS, &c., Per Gross Ton:				
Bessemer billets, Pittsburgh	*26.50*	26.50	27.00	23.00
Forging billets, Pittsburgh	32.00	32.00	32.00	25.00
Open hearth billets, Philadelphia	*29.00*	30.00	30.60	24.50
Wire rods, Pittsburgh	*32.00*	32.00	33.00	27.00
Steel rails, heavy, at mill	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
Steel rails, melting, Chicago	*15.00*	15.00	16.25	14.00
Steel rails, melting, Philadelphia	*15.00*	15.00	16.25	14.75
Iron rails, Chicago	*17.50*	18.00	18.50	16.50
Iron rails, Philadelphia	*20.00*	20.00	20.50	17.50
Car wheels, Chicago	*16.00*	16.00	16.50	14.75
Car wheels, Philadelphia	*15.00*	15.50	16.00	14.50
Heavy steel scrap, Pittsburgh	*15.50*	15.50	17.00	14.25
Heavy steel scrap, Chicago	*13.50*	13.75	14.50	13.00
Heavy steel scrap, Philadelphia	*15.00*	15.00	16.25	14.75
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined iron bars, Philadelphia	1.50	1.50	1.50	1.40
Common iron bars, Chicago	*1.50*	1.50	1.55	1.27½
Common iron bars, Pittsburgh	*1.55*	1.55	1.60	1.30
Steel bars, tidewater, New York	1.61	1.61	1.61	1.36
Steel bars, Pittsburgh	1.45	1.45	1.45	1.20
Tank plates, tidewater, New York	*1.66*	1.71	1.71	1.46
Tank plates, Pittsburgh	*1.50*	1.55	1.55	1.30
Beams, tidewater, New York	1.66	1.66	1.66	1.41
Beams, Pittsburgh	1.50	1.50	1.50	1.25
Angles, tidewater, New York	1.66	1.66	1.66	1.41
Angles, Pittsburgh	1.50	1.50	1.50	1.25
Skelp, grooved steel, Pittsburgh	1.50	1.50	1.50	1.25
Skelp, sheared steel, Pittsburgh	1.60	1.60	1.60	1.35
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	2.40	2.40	2.40	2.20
Wire nails, Pittsburgh*	1.85	1.85	1.85	1.60
Cut nails, Pittsburgh	1.85	1.85	1.85	1.60
Barb wire, galv., Pittsburgh*	2.15	2.15	2.15	1.90
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	**13.25**	13.00	13.00	13.25
Electrolytic copper, New York	*12.75*	12.40	12.87½	13.00
Spelter, New York	*5.05*	5.15	5.60	5.10
Spelter, St. Louis	*4.90*	5.00	5.45	4.92½
Lead, New York	*4.35*	4.40	4.40	4.30
Lead, St. Louis	*4.20*	4.25	4.25	4.25
Tin, New York	**33.25**	32.70	32.45	29.25
Antimony, Hallett, New York	*8.12½*	8.12½	8.25	7.75
Nickel, New York	45.00	45.00	45.00	45.00
Tin plate, 100 lb., New York	$3.84	$3.84	$3.84	$3.64

* These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel f.o.b Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific Coast are 80c. on plates, structural shapes and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets, No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

Structural Shapes.—I-beams and channels, 3 to 15 in., inclusive, 1.50c. to 1.55c., net; I-beams over 15 in., 1.65c., net; H-beams over 8 in., 1.75c.; angles, 3 to 6 in., inclusive, ¼ in. and up, 1.60c., net; angles over 6 in., 1.65c., net; angles, 3 x 3 in. and up, less than ¼ in., 1.75c., base, half extras, steel bar card; tees, 3 in. and up, 1.65c., net; zees, 3 in. and up, 1.60c., net; angles, channels and tees, under 3 in., 1.50c., base, plus 10c., half extras, steel bar card; deck beams and bulb angles, 1.80c., net; hand rail tees, 2.80c., net; checkered and corrugated plates, 2.80c., net.

Plates.—Tank plates, ¾ in. thick, 6¼ in. up to 100 in. wide, 1.50c. to 1.55c., base. Following are stipulations prescribed by manufacturers, with extras to be added to base price (per pound) of plates:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼-in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼-in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. take the price of 3-16-in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Gauges under ¼-in. to and including 3-16-in. on thinnest edge	$0.10
Gauges under 3-16-in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates), 3 ft. and over in length	.10
Complete circles, 3 ft. diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in.	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive	.50
Cutting to lengths or diameters under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

TERMS.—Net cash 30 days.

Sheets.—Minimum prices for mill shipments on sheets in carload and larger lots, on which jobbers charge the usual advances for small lots from store, are as follows: Black annealed sheets, Nos. 3 to 8, 1.70c.; Nos. 9 and 10, 1.75c.; Nos. 11 and 12, 1.80c.; Nos. 13 and 14, 1.85c.; Nos. 15 and 16, 1.95c. Box annealed sheets, Nos. 17 and 21, 2.20c.; Nos. 22 to 24, 2.25c.; Nos. 25 and 26, 2.30c.; No. 27, 2.35c.; No. 28, 2.40c.; No. 29, 2.45c.; No. 30, 2.55c. Galvanized sheets, Nos. 13 and 14, 2.50c.; Nos. 15 and 16, 2.60c.; Nos. 17 to 21, 2.75c.; Nos. 22 to 24, 2.90c.; Nos. 25 and 26, 3.10c.; No. 27, 3.30c.; No. 28, 3.50c.; No. 29, 3.60c.; No. 30, 3.85c. Painted roofing sheets, No. 28, $1.70 per square. Galvanized roofing sheets, No. 28, $3 per square, for 2½-in. corrugations.

Wrought Pipe.—The following are the discounts on the Pittsburgh basing card on carloads of wrought pipe which went into effect January 1:

	Steel. Black.	Steel. Galv.	Iron. Black.	Iron. Galv.
⅛ and ¼ in.	70	54	66	..
⅜ in.	71	57	67	53
½ in.	74	62	70	58
⅝ to 6 in.	78	68	74	64
7 to 12 in.	72	57	68	53
Plugged and Reamed.				
1 to 4 in.	76	66	72	62
Extra Strong, Plain Ends.				
⅛ to ⅜ in.	63	51	59	47
½ to 4 in.	70	58	66	54
4½ to 8 in.	66	54	62	50
9, 10, 11 and 12 in.	54	42	..	..
Double Extra Strong, Plain Ends.				
½ to 8 in.	59	48	55	44

The above steel pipe discounts are for "card weight," subject to the usual variation of 5 per cent.

Boiler Tubes.—Discounts on lap welded steel and charcoal iron boiler tubes to jobbers in carloads are as follows:

	Steel.	Iron.
1 to 1¼ in.	49	43
1¾ to 2¼ in.	61	43
2½ in.	63	48
2¾ to 5 in.	69	53
6 to 13 in.	61	43

2½ in. and smaller, over 18 ft., 10 per cent. net extra.
2¾ in. and larger, over 22 ft., 10 per cent. net extra.

Less than carloads to destinations east of the Mississippi River will be sold at delivered discount for carloads lowered by two points, for lengths 22 ft. and under; longer lengths, f.o.b. Pittsburgh.

Wire Rods.—Bessemer, open hearth and chain rods, $32.

Steel Rivets.—Structural rivets, ¾-in. and larger, 2.15c., base; cone head boiler rivets, ¾-in. and larger, 2.25c., base; ⅝-in. and 11-16-in. take an advance of 15c., and ½-in. and 9-16-in. take an advance of 50c.; in lengths shorter than 1 in. also take an advance of 50c. Terms are 30 days, net cash, f.o.b. mill. The above prices are absolutely minimum on contracts for large lots, makers charging the usual advances of $2 to $3 a ton to the small trade.

The Iron and Metal Markets

Pittsburgh

PARK BUILDING, May 11, 1910.—(*By Telegraph.*)

Pig Iron.—The curtailment in the production of pig iron has already had a beneficial effect on the market, the tone of which is stronger. The feeling is growing that prices of pig iron have touched bottom. There is some inquiry for small lots for May and June shipment, but consumers are still deferring purchases of large blocks for last half of the year delivery until fully satisfied that prices will not be lower. A local dealer has a considerable quantity of basic iron which is being offered for prompt shipment at lower prices than the furnaces will name. A sale of 200 tons of this iron was made at $15, at Valley furnace. We also note another sale of 200 tons, running under 0.22 in phosphorus, at $15.25, Valley furnace. We quote Bessemer iron at $17; basic, $15.25; No. 2 foundry, $15.50; malleable Bessemer, $15.75, and gray forge, $15, all at Valley furnace, the freight rate to Pittsburgh being 90c. a ton.

Steel.—There is not much new inquiry for billets, sheet or tin bars, and in some cases steel is not being taken out as promptly as it was some time ago. More or less tonnage in the shape of Bessemer billets and sheet and tin bars is being offered for resale at relatively low prices. We quote Bessemer 4 x 4 in. billets at $26.50; Bessemer sheet bars, $27 to $27.50; 4 x 4 in. open hearth billets, $28 to $28.50; open hearth small billets, $29.50 to $30; open hearth sheet and tin bars, $28.50 to $29, and forging billets, $32, all f.o.b. Pittsburgh, freight to destination added.

Ferromanganese.—A large steel company outside the Pittsburgh district is reported to have bought in the last few days 5000 tons of foreign 80 per cent., for last half of the year delivery, on the basis of about $40, Baltimore.

(*By Mail.*)

The movement to restrict output of pig iron is now well under way, a number of blast furnaces in the Mahoning and Shenango valleys having already gone out, while others are preparing to shut down within the next two or three weeks. The Carnegie Steel Company has blown out one stack at Youngstown, one at South Sharon and one at New Castle. The Andrews & Hitchcock Iron Company has blown out one furnace at Hubbard. Alice and Claire at Sharpsville are out, Mary at Lowellville will go out this week, and Ella at New Castle will also go out in a few days. Mattie of the Girard Iron Company, at Girard, is scheduled to go out about July 1. Atlantic of the Republic Iron & Steel Company at New Castle will likely blow in this week. In the Pittsburgh district, one Clairton, two Duquesne, one Edgar Thomson, one Lucy and one Neville Island of the Carnegie Steel Company have gone out, Clinton is idle and the National Tube Company has put out one stack at McKeesport. The shutting down of these furnaces will make a heavy reduction in the output of pig iron, and this should help the market. The question that is uppermost in the minds of the blast furnace interests just now is whether the ore producers will continue to demand the advance of 50c. a ton on ore made last fall for this year's delivery. Since the higher rates on ore were fixed, prices on pig iron have declined from $1.50 to $2 a ton. The blast furnace interests declare that if the advance is insisted upon they will allow their furnaces to remain idle, as it will be absolutely impossible to make iron on the new ore prices and sell it at a profit, unless the pig iron market improves. The general situation in the iron trade is about the same as noted in this report last week. Pig iron and steel are quiet, prices being soft, except on open hearth steel, which is firm. On some lines of finished iron and steel, such as tin plate, steel bars, plates and sheets, specifications are coming in at a fairly satisfactory rate, but new orders being entered are light. The pipe and wire trades continue quiet, business being much below expectations. Prices on scrap have gone off a good deal in the last two or three weeks, largely in sympathy with pig iron, but it is believed that bottom has about been reached. The coke trade is quiet, and it is not likely that there will be much betterment in demand for several months at least, with so many furnaces out. A recent contract for furnace coke of standard quality and running over 12 months from July 1, was made at about $1.80 per net ton at oven.

Ferrosilicon.—The new demand is very light, most consumers being covered for a long period ahead. We quote 50 per cent. at $59 to $59.50, Pittsburgh; 10 per cent., $23.90; 11 per cent., $24.90, and 12 per cent., $25.90, all f.o.b. Pittsburgh.

Muck Bar.—There has been no new inquiry for muck bar in this market for several months. We quote best grades, made from all pig iron, at, nominally, $28.50 to $29, Pittsburgh.

Rods.—The quiet condition of the wire trade is reflected in rods, the new inquiry for which is light and only in small lots. Nominal prices of Bessemer, open hearth and chain rods are $32 to $32.50, Pittsburgh, but on a firm offer the lower price would probably be shaded.

Skelp.—There is not much new inquiry for either iron or steel skelp, but the local mills rolling this material have a fair amount of orders on their books. Prices are slightly weaker, in sympathy with other lines of finished material. For ordinary widths and gauges we quote grooved steel skelp at 1.50c. to 1.55c.; sheared steel skelp, 1.60c. to 1.65c.; grooved iron skelp, 1.80c., and sheared iron skelp, 1.90c., all f.o.b. mill, Pittsburgh.

Steel Rails.—The Carnegie Steel Company has recently entered some nice orders for standard sections for export, but domestic roads are placing only small lots for early shipment. The new demand for light rails continues fairly active, the above named company having entered orders last week for about 2500 tons and received specifications against contracts for close to 1000 tons. The new demand for steel axles is only fair and mostly in small lots. We quote steel axles at 1.75c. to 1.80c. and splice bars, 1.50c., at mill, Pittsburgh. Light rail prices are as follows: 8 to 10 lb., $32; 12 to 14 lb., $29; 16, 20 and 25 lb., $28; 30 and 35 lb., $27.75, and 40 to 45 lb., $27, Pittsburgh. These prices are for 250-ton lots and over, and for small lots premiums of 50c. per ton and more are being paid. We quote standard sections at $28, at mill.

Plates.—Orders for steel cars in the past two weeks or more have been light. It is reported that the Harriman lines are again in the market for about 6000 steel cars, and the Louisville & Nashville Railroad has placed orders for 1400 underframes for steel cars, which will be built in its own shops in Louisville. The Chicago Great Western Railroad has placed a contract with the Baldwin Locomotive Works for 50 locomotives, and the Norfolk & Western has ordered 10 locomotives. All the springs for these 1400 cars and for the locomotives above mentioned will be furnished by the Crucible Steel Cmpany. The Carnegie Steel Company has taken about 1000 tons of plates for a new ferry boat for the Bessemer & Marquette Line. The Isthmian Canal commissioners have asked bids on 40,000 to 50,000 tons of plates and shapes for lock gates for the canal, which will take about four years to build. The steel car concerns are fairly well filled up with orders to August, but have practically no business beyond that month. The local plate mills are supplied with work for the next two or three months, but the tonnage being booked in new orders is relatively small. Prices on plates seem to be firmer in the Pittsburgh district just now than at any of the other large consuming centers. We quote ¼-in. and heavier plates at 1.50c. on desirable specifications and 1.55c. on small orders, f.o.b. Pittsburgh.

Structural Material.—The McClintic-Marshall Construction Company has taken about 1000 tons for an addition to the plant of the Victor Safe & Lock Company at Cincinnati, while the American Bridge Company has taken the material for the Karpen Building in Chicago, 5000 to 6000 tons. The Quebec Bridge, which is estimated to require 70,000 to 75,000 tons of plates and shapes, is still on the market, and may not be placed for some time. The general situation remains quiet and low prices continue to be made on such work as is coming out. Prices are fairly strong, but it is evident that some of the large interests are holding off placing contracts in the belief that 1.50c. on plain material cannot be maintained in the face of the drooping market on pig iron and other materials. We continue to quote beams and channels up to 15-in. at 1.50c., while 1.55c. is quoted on small lots, f.o.b. Pittsburgh.

Sheets.—The demand for corrugated roofing sheets has been active in the past week or two, several makers reporting that they have entered some nice orders. The new demand for black and galvanized sheets is fairly heavy, but while the mills are still pretty well filled up on contracts, they are catching up on deliveries to some extent. Prices on black sheets continue to be shaded in some cases about $2 a ton and on galvanized about $3 a ton, the latter being due to the recent heavy decline in spelter. Some of the leading mills are not meeting these concessions in prices, which are confined to three or four mills that are in need of orders for sheets for prompt shipment. The new demand for electric and blue annealed sheets continues heavy, and in some cases slight premiums are still being paid for prompt shipments. Regular prices will be found on another page.

Tin Plate.—The new demand for tin plate is fairly active. Most of the leading mills have contracts that will take their entire output to October 1, and some contracts for bright plate have recently been placed by the can manufacturers for delivery in the last quarter. The McKeesport Tin Plate Company is now operating 20 hot tin mills, while the Phillips Sheet & Tin Plate Company is operating 10 mills at Weirton, W. Va., and 12 at Clarksburg, W. Va., this lattern concern now being the largest individual maker of tin plate in the country. The Jones & Laughlin Steel Company

The Iron and Metal Markets

expects to start up 12 of its new tin mills at Aliquippa next Monday. Prices on tin plate are firm. We continue to quote 100-lb. cokes at $3.60 per base box, f.o.b. Pittsburgh.

Bars.—A waiting game is still going on between the leading implement makers and wagon builders and the larger producers of steel bars, with the result that very few contracts have been placed by these two leading consumers. There is really no necessity for the implement makers or the wagon builders to place their orders for steel bars before August, and they have decided to wait in the belief that possibly they may be able to get lower prices later on than the mills will name now. The mills are maintaining a very firm attitude, and the minimum of the market on merchant steel bars at this time is 1.45½c., and orders are coming in freely at this price. The leading makers of steel bars are pretty well filled up for the next 90 days, and are considerably behind in shipments. A fair amount of new tonnage is being placed in iron bars, but the demand for these is not so active as for steel bars. We quote steel bars at 1.45c. and iron bars at 1.55c., f.o.b. Pittsburgh.

Hoops and Bands.—The new demand for both hoops and bands is reported to have shown some improvement, while specifications against contracts are coming in quite freely. Some of the mills are showing more disposition to seek orders, and prices are not quite so firm as they have been. We quote steel hoops for forward delivery at 1.50c. to 1.60c., while for prompt shipment as high as 1.65c. is obtainable. Steel bands are 1.40c. to 1.50c. on contracts for forward delivery and 1.60c. to 1.65c. for reasonably prompt shipment, these carrying steel bar card extras.

Spelter.—The market is slightly firmer, and prime grades of Western spelter are quoted to-day at 4.95c. to 4.97½c., East St. Louis, the freight to Pittsburgh being 12½c. per 100 lb.

Spikes.—The railroads are placing only small orders for repair work. Small railroad and boat spikes are in fairly active demand, with prices ruling firm. We quote standard sizes of railroad spikes, 4½ x 9-16 in. and larger, at $1.60 to $1.65 for Western shipment and $1.65 to $1.70 for local trade. Boat and small railroad spikes are firm, at $1.75, base, these prices being for carloads and larger lots.

Shafting.—The new demand for shafting continues fairly heavy, while specifications are coming in against contracts at a very satisfactory rate. The leading makers are supplied with work for the next several months and prices are firm. Regular discounts of 55 per cent. off in carloads and 50 per cent. in less than carloads, delivered in base territory, are being firmly held.

Wire Products.—Specifications against contracts are not being received by the mills at a satisfactory rate, and the new demand is not as active by any means as anticipated. In spite of the light demand and the heavy stocks being carried by jobbers, prices are fairly strong, concessions not being more than $1 a ton. There are reports of wire nails being offered as low as $1.75, Pittsburgh, but these are not confirmed. Regular prices on wire products are as follows: Wire nails, $1.85 in carload and larger lots; painted barb wire, $1.85; galvanized, $2.15; annealed fence wire, $1.65; galvanized, $1.95, and cut nails, $1.85, all f.o.b. cars, Pittsburgh, usual terms, with full freight to destination added.

Merchant Pipe.—The Philadelphia Company of this city recently placed contracts for 7 miles of 10-in. pipe with one mill and 10 miles of 10-in. with another maker. An inquiry is still in the market from the Manufacturers' Light & Heat Company for 10 to 15 miles of 10-in. pipe and the same quantity of 12-in. The largest active inquiry in the market just now is that of the Ohio Fuel Supply Company for 50 miles of 20-in. The general condition of the pipe trade is not satisfactory, the demand for merchant sizes being light, but on the larger sizes of line pipe the mills are fairly busy. The mills making wrought iron pipe have recently issued a new card showing a reduction of one point, or $2 a ton. The regular discounts on iron and steel pipe are printed elsewhere in this issue.

Boiler Tubes.—The new demand for both locomotive and merchant tubes is only fair, consumers pursuing the policy of buying in small lots, as prices are none too strong. Discounts on locomotive and merchant tubes printed on a previous page in this issue are sometimes shaded.

Coke.—There is no improvement in either demand or prices, and with the blowing out of a large number of blast furnaces and others getting ready to go out, the outlook in the near future for furnace coke is not promising. One of the Eastern blast furnace interests recently closed a contract for 12,000 tons a month of standard grade blast furnace coke, running over 12 months from July, at about $1.80 per net ton, at oven. We note a sale of 50 cars of blast furnace coke running under 1 per cent. in sulphur for prompt shipment at $1.70, at oven. We quote standard makes of blast furnace coke running under 1 per cent. in sulphur for spot shipment at $1.65 to $1.70, while on contracts for last half of the year from $1.80 to $1.90 is quoted. There is not much new demand for foundry coke, and prices range all the way from $2.15 up to $2.35 for standard makes to consumers, per net ton at oven. Quite a number of coke ovens have been blown out in the past week. The output in the Upper and Lower Connellsville regions last week was 372,803 net tons, a decrease over the previous week of nearly 53,000 tons. In spite of this heavy reduction in output, there is still too much coke being made, and more ovens will have to be blown out until conditions improve.

Scrap.—Some improvement is expected in the local scrap trade in the near future, the embargo on scrap routed for Monessen, Pa., which has been on for some weeks, having been lifted on Tuesday. The Monessen interest is the largest consumer in the Pittsburgh district of steel scrap, and the fact that it has not been taking in any material for several weeks has been severely felt. The material reduction in output of pig iron that is being made is also expected to help the scrap trade. In some quarters it is believed that prices of scrap are probably about as low as they will go and a better buying movement is expected in the near future. Dealers quote about as follows, per gross ton, for delivery at Pittsburgh or elsewhere, as noted:

Heavy steel scrap, Steubenville, Follansbee, Monessen and Pittsburgh	$15.50 to $15.75
Heavy steel scrap, Sharon, Pa., delivery	15.50
No. 1 foundry cast	15.00 to 15.25
No. 2 foundry cast	14.50
Bundled sheet scrap, at point of shipment	13.75 to 14.00
Rerolling rails, Newark and Cambridge, Ohio, and Cumberland, Md.	17.00
No. 1 railroad malleable scrap	15.25 to 15.50
Grate bars	10.00 to 10.25
Low phosphorus melting stock	19.00
Iron car axles	26.50
Steel car axles	22.00 to 22.25
Locomotive axles	26.00
No. 1 busheling scrap	13.50 to 13.75
No. 2 busheling scrap	9.50 to 9.75
Old car wheels	15.00 to 15.50
Sheet bar crop ends	17.00 to 17.50
Cast iron borings	8.00
Machine shop turnings	9.50

We note sales as follows: 1500 tons of heavy steel scrap at $15.50, 500 tons of coil springs at $16, 500 tons of axle turnings at about $12.50, and 800 to 900 tons of cast iron borings at $8.50 and $8.65, delivered, carrying a freight rate of 60c. a ton.

Chicago

FISHER BUILDING, May 11, 1910.—(*By Telegraph.*)

There is a little more new business in finished materials, and specifications are also better than during the month of April. This is especially true in products of general consumption. The leading interest in wire products is receiving specifications at the rate of 6000 tons a day. This is the full normal rate of business, and is especially satisfactory after the heavy buying movement during the fall and winter. In the case of sheets, Western buyers report that the leading interest is still behind on deliveries. The plow manufacturers remain unwilling to accept 1.45c., Pittsburgh, as the minimum for soft steel bars and are slow in contracting for their requirements. Many of them have a considerable tonnage still due them on old contracts, which the mills have been unable to complete, and some of them have considerable stocks in their warehouses which have grown out of uneven deliveries during the winter. The business which has been placed thus far by the agricultural people is chiefly for special sizes and sections on which they will specify early for a year's requirements to guard against the delays last winter which grew out of monthly specifications for small quantities. The structural mills report light specifications for plain material, but the fabricating interests closed a good volume of business last week. The market for structural shapes reflects the feeling among investors regarding the future, and improvement in the number of contracts closed shows more confidence in investment and banking circles. The railroads are inquiring for a large tonnage of bridge work, but have been slow in closing contracts. The trunk lines, however, are considering additional orders for standard rails, and favorable crop reports will undoubtedly force them to increase their general purchases of material. The reluctance of buyers to make forward contracts for finished materials is telling heavily on the scrap market. Last fall buyers of mill products were contracting for six to nine months' requirements. The mills bought heavily of scrap to hedge their sales of finished products, which carried scrap prices to a high level in September and October. There is no such forward buying movement this spring in finished material, while the receipts of scrap during the past month have been large, forcing a sharp decline in values. In copper and other metals there is the same lack of forward consumptive buying. Manufacturing interests in the West are preparing for a stubborn fight against the proposed increases in freight

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rates. The railroads have begun a general advance in commodity tariffs on material used by manufacturers, some of these tariffs having been already filed with the Interstate Commerce Commission, while others are to be filed in the near future. The trunk lines also propose a general advance in class rates between Chicago and New York, which would carry with it an incidental advance in rates on all manufactured iron and steel products between the Atlantic and the Mississippi. Invitations have been issued to numerous associations of manufacturers of material or shipping interests for a conference to be held in Chicago May 17.

Pig Iron.—The curtailment of blast furnace production has failed to awaken any forward buying movement in the Chicago market. Prices of Northern iron for prompt shipment are revised this week, and charcoal iron is also quoted lower. Several lots of Northern iron have been purchased by little foundries, chiefly for early delivery. There are good inquiries pending for Northern foundry for last half, but it is not clear yet whether they will lead to immediate purchases. Southern iron seems to be holding steady, at $12, Birmingham, for No. 2, but No. 3 and analysis iron can be done at $11.50, and several Southern interests are willing to do $12 for the full last half on No. 2. Not much business is being done, however, except in small lots for prompt shipment. Many of the small sales of prompt iron are high silicon Southern grades for use in scrap mixtures. There is an increasing number of complaints from buyers who want prompter shipments, and it is evident that many foundries are nearing the end of their stock piles. It is estimated that foundries in this territory only have enough iron in stock or due them on contracts to carry them an average of two or three months. This is especially true of Southern iron. The malleable foundries are covered further ahead, however, as they bought a considerable tonnage in January and February for the last half. Many of the furnace interests would welcome a shortening in the period for which sales are made. When buyers contract to cover their requirements for nine months to a year, as they did last summer and fall, overproduction may go on for several months, as it has done the past winter, before the furnace interests are able to recognize it and check it, but if buyers were ever satisfied to purchase for two or three months' requirements the industry would adjust itself more quickly to changes in supply and demand. It is understood that many buyers contemplate following this policy in the future in this market. Following quotations are for May and June shipments:

Lake Superior charcoal	$18.50 to $19.00
Northern coke foundry, No. 1	17.50 to 18.00
Northern coke foundry, No. 2	17.00 to 17.50
Northern coke foundry, No. 3	16.50 to 17.00
Northern Scotch, No. 1	18.00 to 18.50
Southern coke, No. 1	16.60 to 17.10
Southern coke, No. 2	16.35 to 16.85
Southern coke, No. 3	16.10 to 16.60
Southern coke, No. 4	15.85 to 16.35
Southern coke, No. 1 soft	16.60 to 17.10
Southern coke, No. 2 soft	16.35 to 16.85
Southern gray forge	15.60 to 16.10
Southern mottled	15.35 to 15.85
Malleable Bessemer	17.00 to 17.50
Standard Bessemer	19.40 to 19.90
Jackson Co. and Kentucky silvery, 6%	19.90 to 20.40
Jackson Co. and Kentucky silvery, 8%	20.90 to 21.40
Jackson Co. and Kentucky silvery, 10%	21.90 to 22.40

(By Mail.)

Billets.—Chicago mills have not yet quoted any market price on billets, although it is possible that a later one of the local mills will have a supply to offer.

Rails and Track Supplies.—Only a few small orders for standard sections of rails were taken by Chicago mills the past week. There are inquiries in the market, however, for a considerable tonnage, as a number of important roads have found that they will need a larger quantity than they have bought for this year. The railroads continue to buy track supplies on a liberal scale, but there is more or less irregularity in prices of spikes. The demand for light rails from store is an important feature of the market, as an unusual number of buyers inquire for small lots of light sections. We quote standard railroad spikes at 1.80c. to 1.90c., base; track bolts with square nuts, 2.50c. to 2.60c., base, all in carloads, Chicago. Light rails, 40 to 45 lb., $27; 30 to 35 lb., $27.75; 16, 20 and 25 lb., $28; 12 lb., $29, Chicago.

Structural Material.—In contrast with the bare order books of the previous week, the structural interests took a number of good contracts last week. The Heisen Building, Chicago, 3000 tons, was let to the Cambria Steel Company. The new prison at Stillwater, Minn., 1200 tons, went to the St. Paul Foundry Company, and the same fabricating interest booked a 500-ton order for a new foundry for the Northern Pacific Railroad at Brainerd, Minn. The Wisconsin Bridge Company was awarded a contract for 1800 tons for additions to the power house of the Omaha & Council Bluffs street railway. The Rialto Building at Kansas City, 1250 tons, was taken by the Kansas City Structural Steel Company. The American Music Hall at Denver, Colo., 600 tons, was let to John Eyckley of Pittsburgh, Pa. A hotel at Cheyenne, Wyo., 220 tons, was let to the Des Moines Bridge & Iron Works. The National Biscuit Company's building at Houston, Texas, will require 410 tons of steel, to be furnished by the Phoenix Iron Works, and 210 tons of castings from the South Halsted Street Iron Works, Chicago. The Llewellyn Iron Works, San Francisco, took two contracts at Los Angeles, one for 700 tons for the Orpheum Theatre and one of 400 tons for the George F. Birkell Building. At San Francisco the Hirshfeld Building was taken by the Ralston Iron Works. The Rock Island lines have ordered 2600 tons of bridge work from the American Bridge Company. Mill orders for plain material have been running rather light for several weeks, owing to the small amount of new business booked by the fabricators, but a few more weeks like the past week will undoubtedly bring out a good volume of specifications. A very large amount of structural business is ready to be let whenever investors are satisfied to go ahead. The hesitation throughout the West during April was undoubtedly due to conditions which had a tendency to make investors pursue a cautious policy. We quote plain material from mill 1.68c. to 1.73c., Chicago; from store, 2c., Chicago.

Plates.—New business is relatively light, but the mills have specifications which will carry them a considerable time. We quote mill prices at 1.68c. to 1.73c., Chicago; store prices, 2c., Chicago.

Sheets.—New business has been picking up the past week and is considerably better than it was in April. Buyers in this market report that the leading interest is still behind on deliveries and the recent shading in prices was by Eastern independent mills which were not so well booked. Four of the new sheet mills of the Inland Steel Company at Indiana Harbor are now ready for operation and probably will start this week. We quote as follows, Chicago: No. 10 annealed, 1.93c.; No. 28 black, 2.58c.; No. 28 galvanized, 3.68c. Prices from store, Chicago, are: No. 10 blue annealed, 2.25c. to 2.35c.; No. 28 black, 2.90c. to 3c.; No. 28 galvanized, 4c. to 4.10c.

Bars.—The plow manufacturers are very backward about placing their contracts for their coming fiscal year. The majority of them still entertain hopes of being able to do better than 1.45c., Pittsburgh, although the mill men insist that this is the minimum. Many of the plow men are still getting material on second contracts which they made last fall, but there has been some business done recently with a number of them. A movement is under way to change the method of giving specifications on these contracts. Heretofore it has been the practice to give monthly specifications on each size or special shape. Altogether there are apparently several hundred sizes of special bar mill shapes used in the agricultural trade, and the mills could be operated with greater economy and better deliveries if the buyer would specify several months' supply of each size. This would save the mills the expense of frequent changes of rolls, and they would be less likely to get behind in deliveries of odd sizes or sections. The miscellaneous demand for bars for concrete work and various industrial uses keeps up at a surprising rate. The hard steel bar mills, which do not aim to sell far ahead, are well supplied with orders, and the bar iron mills expect the business on their books to carry them until another buying movement develops among the railroads. A new 22-in. bar iron mill for rolling large sizes was recently started by the Interstate Iron & Steel Company at East Chicago, giving this company the capacity to roll all the sizes of bar iron that are made in the United States. Subject to the usual delay in delivery of soft steel bars, we quote as follows: Soft steel bars, 1.63c. to 1.68c.; bar iron, 1.50c. to 1.55c.; hard steel bars rolled from old rails, 1.50c. to 1.55c., all Chicago.

Rods and Wire.—Specifications received by the leading interest are improving, gaining about 500 tons a day in April. The demand is well distributed, coming from the jobbing trade as well as industrial buyers. Specifications from fence manufacturers for galvanized wire are especially good. Jobbers' carload prices, which are quoted to manufacturing buyers, are as follows: Plain wire, No. 9 and coarser, base, 1.83c.; wire nails, 2.03c.; painted barb wire, 2.03c.; galvanized, 2.33c., all Chicago.

Merchant Steel.—The demand from store for merchant mill product continues very good. Owing to the oversold condition of the mills in soft steel bar products they generally decline to quote on carload business or even 50-ton lots, and buyers find they must purchase such from store. In all the special lines of steel the demand continues very good. The plow manufacturers are making their contracts for agricultural steel for the coming year with less trouble regarding prices than in the case of soft steel bars.

Cast Iron Pipe.—The St. Louis letting of 2100 tons on which there was some trouble in awarding the contract, has been let to the Dimmick Pipe Company of Birmingham. The

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United States Cast Iron Pipe & Foundry Company was the successful bidder at Cincinnati for 1700 tons, and this interest has also booked orders in the West the past week for several thousand tons of gas pipe. The smaller municipalities are ordering freely and the railroad demand for culvert pipe is fair. It is understood here that freight rates from the Mississippi River to Western points will be advanced 50c. a ton in tariffs, effective June 1. Rates from Eastern and Southern foundries to the river are not changed, but the advance will apply on shipments going to points west of the river. On current business we quote, per net ton, Chicago, as follows: Water pipe, 4-in., $28.50; 6 to 12 in., $27.50; 16-in. and up, $26.50, with $1 extra for gas pipe.

Metals.—The Chicago market for metals has been quiet the past week, as consumers generally pursue a waiting policy. The copper market is depressed by the recent sale of a large lot by a leading producing interest. Spelter has been very weak, owing to overproduction, which was stimulated by the high price last fall. It is understood that mines which cannot produce at a profit when spelter is below 5c. are suspending operations, and this may have a steadying effect on the price. We quote Chicago prices as follows: Casting copper, 12⅞c.; lake, 13⅛c., in carloads, for prompt shipment; small lots, ¼c. to ⅜c. higher; pig tin, car lots, 33¾c.; small lots, 35c.; lead, desilverized, 4.30c. to 4.35c., for 50-ton lots; corroding, 4.55c. to 4.60c., for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 5.30c. to 5.35c.; Cookson's antimony, 10⅜c., and other grades, 9¾c. to 10¼c.; sheet zinc is $7.50, f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote: Copper wire, crucible shapes, 13c.; copper bottoms, 11c.; copper clips, 12¾c.; red brass, 12¼c.; yellow brass, 9½c.; light brass, 7c.; lead pipe, 4¼c.; zinc, 4½c.; pewter, No. 1, 24c.; tin foil, 26c.; block tin pipe, 30c.

Old Material.—The scrap market continues under the influence of heavy offerings by railroads without any corresponding demand from consumers. Most of the buying is done by mills which are already carrying large stocks, and the object is to bring down the average cost of stocks rather than to cover actual needs. The hesitation in forward buying which has been reported for some time in finished materials has had a great influence on scrap prices, as consumers of scrap generally follow the policy of buying to cover their contracts for finished products. The course of the scrap market indicates a general all round lack of forward buying. The greatest decline has been in the special lines used by steel foundries, such as short rails, couplers and knuckles, railroad springs and other choice lines of melting steel. A syndicate of dealers has recently purchased 5000 tons of rail crop ends from a rerolling mill and is having trouble to market them, as the steel and malleable foundries are not interested at present in bargains. Malleable scrap is hard to sell, and the demand for cast scrap is indifferent. Country scrap of any kind is very difficult to place as the market is congested with better grades of material from railroads. The shovel factories are paying lower prices for locomotive tires, car axles are not sought so eagerly and turnings and borings are lower. The market for old car wheels has not disclosed any transactions of moment for a long time to fix a definite price, but the Illinois Central is receiving bids this week on 1000 tons which may throw light on the value of this material. Following prices are per gross ton, delivered, Chicago:

Old iron rails	$17.50 to $18.00
Old steel rails, rerolling	17.00 to 17.50
Old steel rails, less than 3 ft	15.00 to 15.50
Relaying rails, standard sections, subject to inspection	24.00 to 25.00
Old car wheels	16.00 to 16.50
Heavy melting steel scrap	13.50 to 14.00
Frogs, switches and guards, cut apart	13.50 to 14.00
Shoveling steel	13.00 to 13.50

The following quotations are per net ton:

Iron angles and splice bars	$15.00 to $15.50
Iron car axles	20.00 to 20.50
Steel car axles	20.00 to 20.50
No. 1 railroad wrought	12.75 to 13.25
No. 2 railroad wrought	11.75 to 12.25
Springs, knuckles and couplers	12.50 to 13.00
Locomotive tires, smooth	17.50 to 18.00
No. 1 dealers' forge	11.00 to 11.50
Steel axle turnings	10.00 to 10.50
Machine shop turnings	8.00 to 8.50
Cast and mixed borings	5.00 to 5.50
No. 1 busheling	10.50 to 11.00
No. 2 busheling	8.00 to 8.50
No. 1 boilers, cut to sheets and rings	9.50 to 10.00
No. 1 cast scrap	13.00 to 13.50
Stove plate and light cast scrap	11.00 to 11.50
Railroad malleable	13.00 to 13.50
Agricultural malleable	11.50 to 12.00
Pipes and flues	9.50 to 10.00

The molders and coremakers employed by the Bates Machine Company, Joliet, Ill., went out last week after demanding an advance of wages from a minimum of $3 to a minimum of $3.25 a day and a reduction in hours from 10 to 9.

Philadelphia

PHILADELPHIA, PA., May 10, 1910.

Curtailment in pig iron production continues. One Lackawanna furnace at Lebanon has been blown out, also one Alleghany in Virginia. The Warwick Iron & Steel Company has decided to blow out a second furnace, while plans are being made for the blowing out of several other stacks. The sharp reduction in production has resulted in increased interest on the part of consumers, who are testing the market quite freely. A somewhat larger volume of business has been done recently, but the iron market on the whole continues dull. A shade better movement in plates and shapes is reported. A very fair volume of new business is being figured on by shipyards in this district; two vessels were recently awarded to one of the Delaware River builders, and bids for the construction of several additional ones are to be opened in the near future. Further car work is also in sight. Steel billets are quieter and some grades can be had under recent quotations. More activity is shown in furnace coke, but foundry grades are dull. Old material is in very light demand, with prices easy.

Pig Iron.—The only movement has been in foundry irons, particularly in the pipe making grades. Cast iron pipe foundries in this territory have taken on a few lots of 1000 to 2000 tons, while sales of quite a heavy tonnage of Southern and Virginia irons, have been made by local sellers to Virginia pipe foundries. A growing scarcity in Southern pipe grades is noted. In the higher foundry grades the movement has not been so active, sales of lots ranging from carloads to a few hundred tons comprising the bulk of the business done. Consumers have inquiries before the trade for lots running in instances up to several thousand tons, for delivery over the last half and extending into 1911, but few sellers, however, show any disposition, under present market conditions, to quote on such extended delivery. For the most part they endeavor to confine deliveries to the next three months, for which there is still quite a wide range of prices, depending on the position of the various producers. In a number of instances $17, delivered, has been done for standard brands of No. 2 X foundry for May, June and July shipment; other sellers, however, maintain $17.25, delivered, as their minimum for that grade, and in exceptional cases $17.50 and $17.75 has been done for small lots. The usual differential of 50 cents a ton for No. 2 plain iron is not being given by all sellers, some reducing this to 25 cents a ton. Sales of Virginia No. 2 X foundry have been made in lots varying from carloads to 1000 tons at $17.25, delivered in this territory, stove foundries being probably the largest buyers. Southern foundry iron is being more freely offered, but the usually quoted price of $12, Birmingham, for No. 2 foundry, equal to $17, delivered to all rail points in this vicinity, is not sufficiently attractive to induce buying. No transactions in forge iron for rolling mill purposes are reported, although negotiations for several thousand tons for delivery in this vicinity are under way. The recent sharp decline in prices of foundry iron is not so pronounced in forge iron. While there are more offerings of basic at $17, delivered, by sellers in this territory, iron produced outside the district can be had at a concession. In instances it is reported that as low as $16.50 could be done for prompt basic. Consumers, however, show no interest in the market, although one melter, who is also about to become a producer, might, it is stated, be interested at a price. Occasional small lot transactions in low phosphorus iron are made at unchanged prices, the firmness of which is due to the meager supply of this grade. Sellers show no disposition to force business, while buyers, when it comes to actual orders, appear content for the time to purchase principally for near future shipment, for which the following range of prices, delivered in buyers' yards in this vicinity, is named:

Eastern Pennsylvania, No. 2 X foundry	$17.00 to $17.75
Eastern Pennsylvania, No. 2 plain	16.50 to 17.25
Virginia, No. 2 X foundry	17.25 to 17.50
Virginia, No. 2 plain	17.00 to 17.25
Gray forge	16.00 to 16.50
Basic	17.00
Standard low phosphorus	23.00 to 23.25

Ferromanganese.—Consumers in this territory show no tendency to enter the market. Sales for Western delivery have been made, however, in good sized lots, for shipment extending over the last half, and in instances into 1911, at prices said to be under $40.50, Baltimore. For reasonably early deliveries $40.50 to $41, seaboard, is quoted.

Billets.—The market has a trifle easier appearance. Makers report specifications to be coming in freely, but new business is lighter. Some makers are inclined to make concessions for desirable business in rolling steel, and $29 to $30, delivered in this vicinity, about represents the market for open hearth rolling billets. Forging steel continues in good demand, quite a fair volume of business coming from Western consumers. This grade is firm, at $32 to $34, Eastern mill, according to analysis and specification.

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Plates.—A greater volume of business, particularly in boat plates, is before the trade. Awards for the recent proposals for lock work on the Panama Canal are awaited with interest, while a better tonnage for car and bridge work is in sight. Some mills are operating at a slightly greater capacity, and the outlook is considered somewhat better. There is an increased amount of small business, and specifications are also somewhat heavier. Prices are being fairly well maintained at 1.70c. to 1.75c., delivered, in this vicinity.

Structural Material.—No large propositions have been reported closed during the week, although several good sized contracts for building work are pending. The Philadelphia & Reading office building is said to be still open. Some tonnage for a further addition to the Union League building will be required, but the quantity has not been announced. Several small contracts, requiring from 200 to 300 tons, have been placed, but the bulk of the business has been in small lots. Quotations for plain shapes range from 1.65c. to 1.70c., delivered, but these figures could no doubt be shaded for a desirable tonnage.

Sheets.—The demand for sheets continues active, and mills in this vicinity are operating at full capacity. Quotations are firmly maintained, the following range being named for near future shipments: Nos. 18 to 20, 2.80c.; Nos. 22 to 24, 2.90c.; Nos. 25 and 26, 3c.; No 27, 3.10c.; No. 28, 3.20c.

Bars.—A fair inquiry for refined iron bars, particularly small lots for prompt delivery, is noted. Moderate sales at unchanged prices are reported. Developments in the receivership of the Iron & Steel Products Company progress slowly and no arrangements have yet been made to start up any of its various plants. Prices for refined iron bars range from 1.50c. to 1.55c., delivered in this territory, with steel bars quoted at 1.60c. to 1.65c., delivered.

Coke.—A more pronounced movement in furnace coke is reported. One sale of 450,000 tons was made to an Eastern furnace, delivery over five years, price based on a sliding scale. A sale of 12,000 tons for second half delivery at $1.85, at oven, and another of 5000 tons for May shipment at $1.75, have also been reported. Foundry coke continues dull, sales being principally in small lots for near future delivery, at prices ranging from $2.35 to $2.75, at oven. Curtailment of production has had a slight tendency toward stiffening prices, which for delivery in buyers' yards in this territory range about as follows, per net ton:

Connellsville furnace coke	$3.90 to $4.10
Foundry coke	4.60 to 5.00
Mountain furnace coke	3.50 to 3.70
Foundry coke	4.20 to 4.60

Old Material.—The market is extremely quiet in all grades. Wrought turnings and cast borings are lower on heavier offerings, which consumers are not prepared to absorb. There has been no movement in steel scrap, mills declaring that they will not pay over $15, delivered, for strictly No. 1 heavy melting steel. The whole market is soft and transactions in most grades have been insufficient to establish quotations, which are nominally as follows, deliveries in buyers' yard in this vicinity:

No. 1 steel scrap and crops	$15.00 to $15.50
Old steel rails, rerolling	17.00 to 17.50
Low phosphorus	21.00 to 21.50
Old steel axles	20.50 to 21.50
Old iron axles	26.50 to 27.50
Old iron rails	20.00 to 20.50
Old car wheels	15.00 to 15.50
No. 1 railroad wrought	18.00 to 18.50
Wrought iron pipe	15.00 to 15.50
No. 1 forge fire	13.50 to 14.00
No. 2 light iron	8.50 to 9.00
Wrought turnings	10.00 to 10.50
Cast borings	9.50 to 10.00
Machinery cast	15.00 to 15.50
Railroad malleable	15.00 to 15.50
Grate bars	12.50 to 13.00
Stove plate	10.00 to 10.50

Cincinnati

CINCINNATI, OHIO, May 11, 1910.

Interest this week centers in the pig iron markets. A long delayed buying movement is predicted. This conclusion is reached by large agencies from the number and nature of inquiries put up to them in the last few days and from reports from furnace districts announcing rapidly decreased production. Some large consumers in this territory, apparently convinced that $11, Birmingham, for No. 2 will not be reached, have tried to anticipate the time by putting up definite business to agents based on acceptance of that price. So far as can be learned at this time, furnacemen are successfully resisting this temptation, and $12 represents the best price heard for standard Southern iron for delivery over the remainder of the year. There is more interest in the machinery and machine tool markets since the announcements of two or more large lists of tools on Monday. Coke prices are unchanged and scrap is weaker.

Pig Iron.—The week opened with an acceleration of inquiries from all points, but four-fifths of the business offered was based on prices from 25c. to 50c. under the market, and considerable of this business is now in negotiation. A new spot price for Southern iron may be established on the acceptance by a stove manufacturer in central territory of a price of $11.75, Birmingham, for shipment in May, June and July, but for extended deliveries the best price obtainable is $12. Northern furnacemen seem to regard $15.50 as the minimum for remainder of the year, although some recent sales of spot iron have been shaded 25c. or more. A sale on Monday to a local foundry was of 700 tons Northern, 400 tons Southern high phosphorus and 600 tons No. 3 Southern, divided between two popular makers in the Birmingham district. Evidence of a conclusive nature was presented to show that this iron brought a strictly $12 basis price, and that an offer of $11.50 for 500 tons, June delivery, was refused. Aside from a number of inquiries, that may be better dominated feelers, actual inquiries are limited. An Ohio stove maker would take 750 tons Southern—namely, 250 tons of Nos. 2 and 3 foundry and some 4 and 5 per cent. silicon. Some No. 2 soft, between 1000 and 2000 tons, could be used by a manufacturer in Indiana, for delivery over last half, and the St. Louis inquiry of a large steel concern for basic is still unsatisfied. Forge continues very scarce and there is probably little to be had at less than $11.25, Birmingham. A number of offers of $10.75 and even $11 have been refused. The high silicon market seems to be very uncertain and so little is selling that it is difficult to establish prices. Such evidence as is presented suggests that the schedule price is being generally disregarded. The basic market is quiet. It is apparent that a number of foundries in central territory are ready to enter the market, but only at the $11 price, and which one of the Southern furnace interests will be the first to make the break remains to be seen. For prompt shipment and delivery over the remainder of the year, based on freight rates of $3.25 from Birmingham and $1.20 from Ironton, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 foundry	$15.75
Southern coke, No. 2 foundry	15.25
Southern coke, No. 3 foundry	14.75
Southern coke, No. 4 foundry	14.25
Southern coke, No. 1 soft	15.75
Southern coke, No. 2 soft	15.25
Southern gray forge	14.25
Ohio silvery, 8 per cent. silicon	19.70
Lake Superior coke, No. 1	17.20
Lake Superior coke, No. 2	16.70
Lake Superior coke, No. 3	16.20
Standard Southern car wheel	25.25 to $25.75
Lake Superior car wheel	22.25 to 22.75

(By Mail.)

Coke.—The feature of the week is the progress made in curtailment which is now proceeding in all districts. Furnacemen seem to be holding off, and there remains a large tonnage of coke to be contracted for for the last half of the year. Foundries are slow in contracting for their last half needs also. Connellsville foundry grades are quotable at $2.25 to $2.75 per net ton, at oven, for spot deliveries, and on contract the price ranges from $2.40 to $2.75. Connellsville furnace brands are offered at $1.75 to $1.90 for spot, and contracting is proceeding on a basis of $1.85 to $2. Wise County furnace is very quiet, with contracting on a sliding scale basis. Wise County foundry is quotable at $2.35 to $2.50 for spot delivery and contracts on about the same basis. Pocahontas foundry is selling at $2.35 to $2.50.

Finished Material.—The existing strike in erecting circles of the structural and ornamental iron trade has affected contracting in heavy tonnages, but yard and warehouse business is reported better and improving daily. A good sized job on which bids have been opened and a decision is due is the new Chesapeake & Ohio viaduct at Louisville, about 2000 tons. The Louisville & Nashville and the Chesapeake & Ohio railroads have agreed with the South Covington & Cincinnati Street Railway Company on the size and character of the new viaduct to be erected at the head of Monmouth street in Covington. The viaduct will be 950 ft. in length. The iron bar business is demoralized, and prices range all the way from 1.45c. to 1.70c., Cincinnati. Dealers usually add ¼c. per pound for refined bars. Steel bars range from 1.45c. to 1.55c., Pittsburgh, and from warehouse in small lots, 1.90c. Structural material is quoted at 1.70c., Cincinnati, in large lots, and in small lots dealers are getting 2c.

Old Material.—Practically all dealers are convinced that the market is destined to reach still lower levels. Mills are showing absolutely no interest and there is no movement save shipments on contracts, which are fair. A few relayers for points west of St. Louis have been purchased here. A careful revision of price tables, taking into consideration latest transactions and basing others on what the largest dealers are willing to take, show a still further decline in

The Iron and Metal Markets

prices; and these, which include delivery in buyers' yards, this vicinity, are as follows:

No. 1 railroad wrought, net ton	$12.50 to $13.00
Cast borings, net ton	5.50 to 6.50
Heavy melting steel scrap, gross ton	12.00 to 13.00
Steel turnings, net ton	7.00 to 8.00
No. 1 cast scrap, net ton	12.00 to 13.00
Burnt scrap, net ton	9.00 to 10.00
Old iron axles, net ton	16.00 to 17.00
Old iron rails, gross ton	17.50 to 18.00
Old steel rails, short, gross ton	15.00 to 15.50
Old steel rails, long, gross ton	15.00 to 15.50
Relaying rails, 56 lb. and up, gross ton	22.00 to 23.00
Old car wheels, gross ton	13.00 to 13.50
Low phosphorus scrap, gross ton	16.00 to 16.50

Buffalo

BUFFALO, N. Y., May 10, 1910.

Pig Iron.—There appears to have been a little improvement in the tone of the market during the week, and a larger proportion of inquiries received are materializing into orders than was the case the previous week. The aggregate tonnage placed was small, however, orders being principally for carload or 100-ton lots, although one for 1000 tons of foundry grades from an Eastern radiator concern was included. Among current inquiries was one for 5000 tons of No. 2 X foundry and No. 2 plain from an agricultural implement maker. Stocks on furnace banks in this district are being reduced at a rapid rate, as shipments on contracts are very heavy, and two furnaces are out of commission. The statement is made that stocks on hand at the present time are only about one-third of what they were a year ago, and orders on books are nearly three times heavier than for the corresponding period in 1909. Prices are no firmer, as the spirit of conservatism in buying still prevails among consumers; but there is diminished effort to secure orders on the part of the furnacemen, who are inclined to wait for better prices where extended deliveries are involved. We quote as follows per gross ton, f.o.b. Buffalo, for current and third quarter delivery:

No. 1 X foundry	$16.25 to $16.75
No. 2 X foundry	16.00 to 16.50
No. 2 plain	16.00 to 16.25
No. 3 foundry	15.75 to 16.00
Gray forge	15.50 to 16.00
Malleable	16.00 to 16.75
Bessemer	17.50 to 18.00
Basic	16.50 to 16.75
Charcoal	19.25 to 19.75

Finished Iron and Steel.—The demand for bar mill products and cold drawn steel continues active, with no improvement in mill deliveries. The bar mill capacity of the Lackawanna Steel Company has been increased by remodeling and enlargement and installation of additional machinery, including a 750-hp. tandem compound Hamilton-Corliss engine for driving the 16-in. train. A tie plate department has also been added. The Superior Motor Vehicle Company, which is erecting a factory in Buffalo, has closed contracts for about 1000 tons of bar steel and axle billets to be used in the manufacture of automobile axles and drop forgings. There is some increase in structural projects; plans have been completed for the Wellman Brothers' department store, Jamestown, N. Y., and bids for the steel, about 250 tons, will go in this week. The Chautauqua Traction Company will also build an extensive addition to its power station at Jamestown, involving a considerable tonnage of steel. Bids went in last week for the structural steel for the Solvay Process Company's viaduct at Syracuse, about 350 tons, and bids are going in this week for about 800 tons of structural material for the two new blast furnaces to be erected at South Buffalo by the Rogers-Brown Iron Company. The Buffalo Structural Steel Company has been awarded contracts for the steel for the Superior Motor Vehicle Company's plant, Buffalo, 250 tons, the William H. Hotchkiss warehouse, Buffalo, 450 tons, and the addition to the McCurdy-Norwell Company building, Rochester, 375 tons.

Old Material.—The market shows no improvement and the outlook is not promising. The feeling of pessimism among dealers appears to be a little more pronounced, as there is no movement toward buying on the part of consumers and many of the latter are now holding back on contract shipments. Prices are nominal. We quote as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel	$15.00 to $15.50
Low phosphorus steel	19.00 to 19.50
No. 1 railroad wrought	13.00 to 16.50
No. 1 railroad and machinery cast scrap	15.00 to 15.50
Old steel axles	19.00 to 19.50
Old iron axles	22.75 to 23.25
Old car wheels	16.00 to 16.50
Railroad malleable	15.50 to 16.00
Boiler plate	13.00 to 13.50
Locomotive grate bars	12.00 to 12.50
Pipe	12.50 to 13.00
Wrought iron and soft steel turnings	8.50 to 9.00
Clean cast borings	7.50 to 8.00
No. 1 busheling scrap	13.50 to 14.00

Cleveland

CLEVELAND, OHIO, May 10, 1910.

Iron Ore.—The total ore shipments from the Lake Superior district during April reached 1,520,305 tons, which is the largest movement ever made during that month. Shipments are slowly increasing, but the merchant ore firms are holding back because few consumers are ready to take their ore. Docks are still well filled, so that shippers are trying to avoid further accumulation. No inquiries for ore are coming out. We quote prices as follows: Old range Bessemer, $5; Mesaba Bessemer, $4.75; Old Range non-Bessemer, $4.20; Mesaba non-Bessemer, $4.

Pig Iron.—The market is absolutely lifeless. No new inquiries of any consequence have come out and some previously pending have not yet resulted in orders. Consumers feel that although the production has been curtailed considerably by blowing out stacks, prices will be no higher until the stock piles in furnace yards are greatly reduced, and so are delaying purchases for last half requirements. Several producers are staying out of the market at the present prices and are holding for prices about $1 a ton higher than the ruling quotations. While No. 2 foundry is nominally quoted at $15.50, Valley furnace, there are persistent reports that one or two Valley interests are offering No. 2 foundry at $15, at furnace, for delivery through the last half. Claire furnace of M. A. Hanna & Co., Sharpsville, Pa., was blown out last week and it is understood that at least two of the southern Ohio furnaces will be blown out within the next few weeks. The steel, malleable and the light gray foundries appear to be fairly busy, but the demand for heavy iron castings has fallen off. For spot shipment and second quarter delivery we quote, delivered, Cleveland, as follows:

Bessemer	$17.90
Northern foundry, No. 1	$16.50 to 17.00
Northern foundry, No. 2	16.15 to 16.50
Northern foundry, No. 3	15.75 to 16.00
Gray forge	15.90
Southern foundry, No. 2	16.10 to 16.35
Jackson Co. silvery, 8 per cent. silicon	21.05 to 21.55

Coke.—The market continues very weak and inactive. With the inducement of the present low prices, foundries are not placing contracts for their last half requirements. We quote standard Connellsville furnace coke at $1.80 to $1.85 per net ton, at oven, for spot shipment, and $1.95 to $2 on contract. Connellsville 72-hour foundry coke is held at $2.30 for spot shipment and $2.35 to $2.50 on contract.

Finished Iron and Steel.—Very few contracts are being placed for last half delivery. Buyers generally feel that prices will be no higher, but possibly lower, and so many are holding off in placing contracts for future requirements. They are also hesitating about placing contracts, because, while plants are generally well filled with work at present, new orders for many products are not as plentiful as they were. Mills are getting a fair volume of specifications on contracts and current orders for small lots of finished material are holding up quite well. Warehouse orders received by jobbers continue good. A few additional steel bar contracts were placed by implement makers in this territory during the week. The business outlook with the implement men is very satisfactory. Steel bars are firm at 1.45c., Pittsburgh, and not much improvement is noticed as yet in deliveries. The demand for plates is only fair; some of the mills can make good deliveries and are eager for business. The 1.50c., Pittsburgh, price on plates is being more generally quoted, although sales in small lots are being made on the 1.55c. basis. There is a good demand for small lots of structural material, which is firm in this market at 1.55c., Pittsburgh. The American Shipbuilding Company has taken a contract from the Marquette & Bessemer Dock & Transportation Company for a car ferry to take the place of the one lost in Lake Erie last December, and has placed the contract for the structural steel and plates, 2000 tons, with the Carnegie Steel Company. New structural material inquiries include those for a new plant for the Firestone Tire & Rubber Company, Akron, Ohio, which will require 2000 tons, the City Investment Company building, Cleveland, that will take 1200 tons and a school building in Erie, Pa., 200 tons. Local fabricating shops are well filled with work, and the outlook continues very satisfactory. The demand for sheets is not active and prices are being shaded $1 on black and $2 on galvanized, and possibly more. The demand for pickled sheets is heavy, the large consumption being attributed to the automobile trade. The demand for shafting is still active and deliveries are getting further behind. The demand for rivets has fallen off somewhat and makers are promising better deliveries. Prices are firm. The demand for iron bars is light and prices are weak. We quote iron bars at 1.45c. to 1.50c., Cleveland.

Old Material.—The market continues very dull. The price tendency is still downward, and quotations on a few grades have been further reduced. Mills are taking scrap on contract well, but practically no new business is coming

The Iron and Metal Markets

out. The only sales reported are small lots for immediate needs. Some dealers have accumulated large stocks, which they expect to hold for better prices. Railroad lists this week include a small tonnage from the Big Four and about the usual amount from the Norfolk & Western. Prices per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails	$15.50 to $16.00
Old iron rails	17.50 to 18.00
Steel car axles	22.00 to 22.50
Heavy melting steel	13.75 to 14.25
Old car wheels	15.00 to 15.50
Relaying rails, 50 lb. and over	22.50 to 23.50
Agricultural malleable	13.00 to 13.50
Railroad malleable	15.00 to 15.50
Light bundled sheet scrap	10.50 to 11.00

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	$21.50 to $22.00
Cast borings	7.25 to 7.75
Iron and steel turnings and drillings	8.50 to 9.00
Steel axle turnings	11.00 to 11.50
No. 1 busheling	12.00 to 12.50
No. 1 railroad wrought	14.75 to 15.25
No. 1 cast	13.25 to 13.50
Stove plate	11.50 to 12.00
Bundled tin scrap	11.00 to 11.50

Birmingham

BIRMINGHAM, ALA., May 9, 1910.

Pig Iron.—The condition of this market is practically the same as last week, none of the parties concerned having conceded their several positions in the matter of price. An aggregate of some 5000 to 7000 tons is reported sold during the past week, but the buying was largely on the hand to mouth order and the demand of rather a desultory nature. It is believed that no lower figures than a basis of $12, Birmingham, for No. 2 foundry have so far been made. Such a price is quoted by the majority of the producing interests, but in most cases applies only to deliveries during the next six months. For strictly last quarter shipments $12.50, Birmingham, is being asked by all producers except a leading interest that adheres to a basis of $13 for any delivery during the remainder of this year. As to just what price could be had by a firm offer for a round tonnage for shipment direct to the melter there is some difference of opinion among the best authorities. It is pretty generally understood that the matter of delivery would not be allowed to interfere with sales on a $12 basis, while it is intimated that offers of $11.75 per ton for round tonnages for spot shipment would not be refused by some of the producers if made by the melters direct. The efforts of merchant interests to secure round tonnages at concessions from the $12 schedule are known to have been so far unsuccessful. The inquiry from all quarters of the trade is more encouraging and in more definite form than some weeks ago, the tonnage submitted for serious consideration being very attractive in the aggregate, but there is a tendency on the part of all buyers to await further developments before the consummation of negotiations, and a more active market is not expected at an early date. In the meantime producers are following the course previously mentioned and are adjusting the output to actual requirements of order books as rapidly as is practicable. The total output of foundry grades in this district is now represented by 16 active stacks, with 10 additional stacks available that are now idle.

Old Material.—The condition of this market does not improve. Dealers adhere to prices $1 per ton lower than last quoted, but they are disposed to follow a conservative course in adding to stocks. The aggregate movement from this district is very light and the leading local consumers are inclined to consider bargain lots only. We quote dealers' asking prices as follows, per gross ton, f.o.b. cars here:

Old iron axles	$17.00 to $17.50
Old iron rails	13.00 to 13.50
Old steel axles	16.50 to 17.00
No. 1 railroad wrought	12.00 to 12.50
No. 2 railroad wrought	9.50 to 10.00
No. 1 country wrought	9.00 to 9.50
No. 2 country wrought	8.50 to 9.00
No. 1 machinery	10.50 to 11.00
No. 1 steel	9.50 to 10.00
Tram car wheels	10.00 to 10.50
Standard car wheels	11.50 to 12.00
Light cast and stove plate	7.50 to 8.00

Cast Iron Pipe.—Reports for the past week are without specific data as to lettings for the early future other than those already mentioned. It is understood that the tonnage now on order books and that reasonably expected to be placed during the remainder of this month will take care of the entire producing capacity during the summer months. The comparatively small lots recently offered for maintenance work and extension by small municipalities have been placed at higher figures than formerly received, and even for large tonnages it is now doubtful if material shading of published quotations could be effected notwithstanding the low price of pig iron. As a whole, this market is considered in a satisfactory condition and we quote as follows for water pipe, per net ton, f.o.b. cars here: 4 to 6 in., $24; 8 to 12 in., $23; over 12 in. average $22, with $1 per ton extra for gas pipe.

No. 1 furnace of the Tennessee Coal, Iron & Railroad Company, at Bessemer, has been blown out for relining.

St. Louis

ST. LOUIS, May 9, 1910.

Coke.—The demand continues to be confined to small lots, principally for prompt shipment. The only sale of importance reported was 1500 tons of Virginia coke. The feeling is stronger and a slight advance is demanded by some sellers. We quote for spot shipment $2.35; for contract coke, $2.50 per net ton, f.o.b. oven, Connellsville. The best brands of Virginia are also held at these prices.

Pig Iron.—The leading sales agencies report numerous inquiries from a wide range of territory, but they are mainly for the purpose of keeping in touch with the situation. The representative of a leading Southern producer reports sales aggregating 2000 tons, mostly No. 2 foundry, for scattered shipment. Some difficulty is being experienced in placing orders for No. 1 soft. An inquiry is out from a local steel foundry for 5000 tons of basic, for shipment over the last quarter. While none of the leading sales agencies is offering at less than $12, Birmingham, it is intimated that firm offers of $11.75 could be worked with some producers. In some offices $12.50 is asked, but business is not possible nor expected. Some claim that the market is firmer, while others see no improvement. Taking the past four months together, a larger tonnage of pig iron has been sold by St. Louis offices than was the case for the corresponding time last year. We quote for No. 2 Southern foundry, for shipment over the last half, $12, Birmingham, with a premium demanded for the last quarter. Southern Ohio is held at $16 to $16.50, f.o.b. furnace.

Lead, Spelter, Etc.—Lead is steady at 4.25c.; spelter is easier and quiet at 4.95c., East St. Louis. Zinc ore is weaker at $37 per ton, Joplin, base. Tin is up ⅛c.; antimony unchanged; copper steady. For the past week business in finished metals averaged very good.

Old Material.—There is very little doing and such business as is passing is confined almost entirely to dealers. Contract specifications, of course, require attention, but dealers are still looking for new bookings. There is no shipping demand. Stocks are moderate and but one railroad is offering—250 tons by the Vandalia Line. The list continues nominally unchanged. Relaying rails, especially heavy sections, are very scarce and urgently wanted. We quote dealers' prices as follows, per gross ton, f.o.b. St. Louis:

Old iron rails	$15.00 to $15.50
Old steel rails, rerolling	15.00 to 15.50
Old steel rails, less than 3 ft	13.50 to 14.00
Relaying rails, standard sections, subject to inspection	26.00 to 26.50
Old car wheels	15.00 to 15.50
Heavy melting steel scrap	13.50 to 14.00
Frogs, switches and guards, cut apart	13.50 to 14.00

The following quotations are per net ton:

Iron fish plates	$14.00 to $14.50
Iron car axles	21.00 to 21.50
Steel car axles	19.50 to 20.00
No. 1 railroad wrought	13.50 to 14.00
No. 2 railroad wrought	12.50 to 13.00
Railway springs	12.00 to 12.50
Locomotive tires, smooth	16.50 to 17.00
No. 1 dealers' forge	11.00 to 11.50
Mixed borings	6.50 to 7.00
No. 1 busheling	12.00 to 12.50
No. 1 boilers, cut to sheets and rings	9.50 to 10.00
No. 1 cast scrap	11.50 to 12.00
Stove plate and light cast scrap	9.50 to 10.00
Railroad malleable	11.25 to 11.75
Agricultural malleable	10.00 to 10.50
Pipes and flues	9.25 to 9.75
Railroad sheet and tank scrap	8.50 to 9.00
Railroad grate bars	9.00 to 9.50
Machine shop turnings	9.50 to 10.00

Frederick Essen is managing a deal for the building of a new street car line 14 miles long, which will extend from Hodiamont to Creve Coeur Lake, in the suburbs of this city.

The St. Louis Car Company within the last 10 days closed orders for electric street railroad cars with Los Angeles, Salt Lake City, Ogden, New Orleans and Birmingham. These orders aggregate upward of $750,000.

The new steel plant of the American Steel Foundries at Granite City, Ill., has started up. In the month of April the Granite City plant turned out over 10,000 tons of steel castings. The starting up of the new addition requires increasing the working force to a total of 3000 men.

The Galva Heater Company, Galva, Ill., has been incorporated to manufacture and sell boilers, radiators and steam and hot water plants; capital stock, $30,000; incorporators, E. L. Yocum, C. H. Lyford and H. A. Smith.

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New York

NEW YORK, May 11, 1910.

Pig Iron.—The business of the past week has shown that while the market is not lifeless there is nothing yet resembling even the preliminary stages of a real buying movement. Some foundries have been willing to provide for a small portion of their requirements at the prices which have been reached in the past fortnight, and producers have found that at further concessions of 25c. to 50c. they might considerably increase their sales. In view of the cutting down of output, in which more eastern Pennsylvania furnaces are participating this week, these concessions are not forthcoming. So much shrinkage in values having taken place, it is likely that fluctuations in the near future will be within quite narrow limits. Inquiries for 200, 300 and 500 ton lots have been coming up, deliveries being chiefly for third quarter and second half. In various New York State centers foundries seem to have good supplies of iron for the next two months and show little interest in the market. Eastern pipe foundries continue to buy from week to week and have lately taken several thousand tons of Alabama and Virginia iron. We quote Northern iron at tidewater as follows: No. 1, $17.50; No. 2 X, $17.25; No. 2 plain, $17 to $17.25. On Southern iron we quote $17.25 for No. 1 and $16.75 to $17 for No. 2.

Steel Rails.—The New York, West Chester & Boston Railway Company is expected to place in the next two weeks the rails for which its inquiry first came out some months ago. About 15,000 tons of 90-lb. rails will be wanted. The Bangor & Aroostook Railroad is in the market for about 2500 tons of standard sections. The Carnegie Steel Company has sold 2500 tons additional of open hearth rails to the Norfolk & Western and 1000 tons of Bessemer rails to the Toledo & Ohio Central. On the recent Panama letting the Bethlehem Steel Company was awarded 5000 tons of open hearth rails.

Ferroalloys.—Ferrosilicon is quoted around $60, Pittsburgh. It is understood locally that the foreign price has been advanced for future delivery. Ferromanganese is quoted at $41, Baltimore. The market is dull.

Finished Iron and Steel.—While inquiries are still plentiful from the country at large, and speaking generally of all lines, decisions on contracts are backward. This territory has just experienced an especially quiet week. Building matters closed have been few, but the only very large one in prospect and still to be settled is that for the Bankers' Trust Building, for which 7000 to 8000 tons, it is expected, will be required. The Stern Brothers' store, 3500 tons, and the 19-story office building at 218 Fifth avenue, 1800 tons, were taken by the Hay Foundry & Iron Works and Milliken Bros. secured a loft building on Thirty-first street of 1500 tons. The general contract for the Ruppert brewery was awarded to the George A. Just Company, and it is understood that Bethlehem shapes will be used. Among contracts for buildings outside of New York City, the following were closed: A building for the General Electric Company at Pittsfield, Mass., 550 tons, given to Levering & Garrigues; a building for the Standard Gauge Steel Company, Beaver Falls, Pa., 500 tons, to the Pennsylvania Bridge Company; the Hotel Burlington, Burlington, Iowa, 500 tons, to the Noelke-Richards Iron Works. Bids have been received on 2000 tons for the Lawrence Building in Boston, Mass. Difficulty in getting deliveries is hampering some fabricators. A few of the pending contracts from the railroads for bridge material have been decided, but a considerable tonnage remains to be placed. The American Bridge Company secured 2600 tons for the Rock Island, 300 tons for the Baltimore & Ohio and 300 tons for the Coal & Coke Railway of West Virginia. For the Pennsylvania Lines West about 2400 tons was placed, divided in small lots among a number of fabricators. The Chicago Great Western has withdrawn its inquiry for 5000 tons and is now asking bids on 100 tons. Specifications are heavy, particularly on steel bars, and deliveries still far behind, with the effect that the price on steel bars is the firmest of all prices. The plate trade in this immediate vicinity is rather slow. About 300 tons will be required for 48-in. and 30-in. pipe for the Board of Water Supply to be used around Jerome Park. Bids have gone in on 25,000 tons of plates for the lock gates at Panama, but there is not very keen interest in it here on account of the low price named for plates in the bids opened May 5—1.50c., delivered at Colon. Two ships are to be built by the New York Shipbuilding Company for the Chesapeake Steamship Company, probably to require about 1000 tons of plates each, the order for which will probably be placed in the Philadelphia market. We quote plates at 1.71c., plain structural material at 1.66c., steel bars at 1.61c., and bar iron at 1.55c., all New York.

Cast Iron Pipe.—The most important business pending in this vicinity is the opening of bids to-day for 9000 tons of water pipe for the Brooklyn high pressure service. The municipalities in the East are purchasing much smaller quantities of pipe than usual. The lettings are seldom more than a few hundred tons. On some of the contracts of this kind recently awarded the successful bidders have named prices somewhat lower than those prevailing last month. The general demand is slow. Quotations are nominally $25.50 to $26 per net ton, tidewater, for carload lots of 6-in.

Old Material.—Business is quiet, transactions being confined to small lots. A sale of 500 tons is a striking exception to the usual run of business. Some classes of material have been completely inactive, as, for instance, relaying rails, steel scrap, old car wheels and wrought scrap. The foundries are buying quite sparingly, as they are by no means pressed with work. A feature of the situation is the anxiety of dealers to dispose of their stocks. They have been stubbornly holding off a long time in the hope that a turn for the better would come, but they are now greatly discouraged and are pressing sales. For this reason our quotations are purely nominal. It is possible that lower prices have been made on forced sales than the following, which are per gross ton, New York and vicinity, for material purchased in the regular way:

Rerolling rails	$13.00 to $13.50
Old girder and T rails for melting	12.50 to 13.00
Heavy melting steel scrap	12.50 to 13.00
Relaying rails	20.00 to 21.00
Standard hammered iron car axles	23.00 to 24.00
Old steel car axles	18.50 to 19.00
No. 1 railroad wrought	14.50 to 15.00
Wrought iron track scrap	13.00 to 13.50
No. 1 yard wrought, long	13.00 to 13.50
No. 1 yard wrought, short	12.50 to 13.00
Light iron	6.00 to 6.50
Cast borings	7.00 to 7.50
Wrought turnings	8.00 to 8.50
Wrought pipe	12.00 to 12.50
Old car wheels	12.50 to 13.00
No. 1 heavy cast, broken up	12.50 to 13.00
Stove plate	9.50 to 10.00
Locomotive grate bars	9.50 to 10.00
Malleable cast	12.00 to 12.50

Metal Market

NEW YORK, May 11, 1910.

THE WEEK'S PRICES

Cents Per Pound.

	Copper.			Lead.		Spelter.	
May.	Lake.	Electrolytic.	Tin.	New York.	St. Louis.	New York.	St. Louis.
5	13.00	12.40	32.77½	4.40	4.25	5.15	5.00
6	13.00	12.40	32.97½	4.40	4.25	5.15	5.00
7	13.00	12.40	....	4.40	4.25	5.15	5.00
9	13.00	12.40	32.90	4.40	4.25	5.05	4.90
10	13.25	12.75	33.10	4.35	4.20	5.05	4.90
11	13.25	12.75	33.25	4.35	4.20	5.05	4.90

Conditions existing in the metal trade are more encouraging. Copper has a firmer tone and tin is stronger. Considerable trading is reported in both metals.

Copper.—The Producers' Association report tended to strengthen the copper market materially. A much larger production was anticipated. Exports have also improved. The report, which is given in another column, shows smaller stocks on hand, and following it the market went up on Tuesday. Electrolytic was generally quoted around 12.75c. Some sellers were holding it for as much as 12.87½c. An order at 12.65c. for export, which was offered to a large New York house, was promptly refused. The trade generally considers the market a strong one, and there is no disposition, as far as can be learned, to cut prices. No phenomenal advance is looked for; however, it is predicted that lake will not go below 13.25c. for some little time. Advances in the London market have also helped out the situation here. Exports to May 10 are 4871 tons. Spot copper was sold in London to-day for £57, and futures for £57 17s. 6d. The sales were 700 tons of spot and 2600 tons of futures. The New York price to-day was 33.25c.

Waterbury Average.—The Waterbury average for April was 13.25c.

Pig Tin.—There is quite an optimistic feeling. The demand is increasing, and as summer approaches it is the opinion of the trade that the price will stiffen. Local stocks have been heavily drawn on to cover old contracts, and there has been a satisfactory amount of local trading. A considerable tonnage changed hands in the local market yesterday. Arrivals of tin figure up 1125 tons, and 1280 tons are afloat. The market closed in London to-day for spot tin at £150 12s. 6d., and futures for £152. Sales amounted to 450 tons of spot and 500 tons of futures.

Tin Plates.—Tin plates are easier to get and premiums asked for prompt deliveries are not so high as a short time since. Not very much local buying is reported, although the dealers are optimistic as to the future demand. The domestic price is unchanged and in New York is $3.84 for 100-lb. coke plates. The foreign price has advanced and Swansea plates are quoted at 13s. 3d.

Lead.—There is very little to report on lead. It is slow

The Iron and Metal Markets

and not much business is being booked, which is a little disappointing. The American Smelting & Refining Company reduced its price on Tuesday to 4.40c., which reduction is understood to be shaded by the outside sellers some five points.

Spelter.—Spelter is weak. The market is generally quoted at 5c. to 5.05c., New York. The producers claim that they cannot afford to sell it at that price considering the price of ore. It is asserted, however, that it would take a fair amount of buying to send this nominal price higher. We quote for St. Louis around 4.90c.

Antimony.—Antimony is unchanged and only a few sales are reported. Hallett's is quoted at 8.12½c., Cookson's at 8.37½c., and the Hungarian grades around 7.25c.

Old Metals.—The market is quiet, with dealers' selling prices nominally unchanged, as follows:

	Cents.
Copper, heavy cut and crucible	12.25 to 12.50
Copper, heavy and wire	12.00 to 12.25
Copper, light and bottoms	11.00 to 11.25
Brass, heavy	8.50 to 8.75
Brass, light	7.00 to 7.25
Heavy machine composition	11.50 to 11.75
Clean brass turnings	7.75 to 8.25
Composition turnings	9.75 to 10.00
Lead, heavy	4.05 to 4.20
Lead, tea	3.80 to 3.95
Zinc, scrap	4.25 to 4.50

Iron and Industrial Stocks

NEW YORK, May 11, 1910.

Some strength was injected into the stock market the past week by announcements of important sales of railroad bonds in Europe which were regarded as affording substantial financial relief. The market was active for only a short time, however, and for the remainder of the week was dull but comparatively firm. The range of prices on active iron and industrial stocks from Thursday of last week to Tuesday of this week was as follows:

Allis-Chalm., com.	9⅞ - 10¼	Railway Spr., com.	38 - 40
Allis-Chalm., pref.	35	Republic, com.	32⅞ - 34⅜
Beth. Steel, com.	27¼ - 29½	Republic, pref.	97 - 98
Can, com.	9⅝ - 10⅛	Sloss, com.	71¾ - 73½
Can, pref.	71⅜ - 72¼	Pipe, com.	21 - 21½
Car & Fdry, com.	58¼ - 61⅞	Pipe, pref.	73 - 74½
Car & Fdry, pref.	113 - 115	U. S. Steel, com.	80⅝ - 83¼
Steel Foundries	56 - 58	U. S. Steel, pref.	116⅞ - 118¼
Colorado Fuel	37½ - 38⅞	Westinghouse Elec.	62½ - 65
General Electric	146⅛ - 149	Va. I., C. & C.	58
Gr. N. ore cert.	62¼ - 64¼	Am. Ship, com.	77 - 82¾
Int. Harv., com.	91⅝ - 94¾	Am. Ship, pref.	110½ - 111½
Int. Harv., pref.	122	Chi. Pneu. Tool	40 - 43
Int. Pump, com.	44 - 47½	Cambria Steel	45¼ - 46½
Int. Pump, pref.	84½ - 85⅞	Lake Sup. Corp.	21½ - 22
Locomotive, com.	46¾ - 49¾	Crucible St., com.	13 - 13¼
Nat. En. & St., com.	21	Crucible St., pref.	84 - 85
Pressed St., com.	38 - 39½	Harb.-W. Ref., com.	34
Pressed St., pref.	98½ - 99½	Harb.-W. Ref., pref.	94

Last transactions up to 1 p.m. to-day are reported at the following prices: Allis-Chalmers common 9⅞, preferred 34⅞; United States Steel common 83¼, preferred 118⅛, bonds, 104; Car & Foundry common 61⅝, preferred 113; Locomotive common 50½, preferred 110; Colorado Fuel, 39⅜; Pressed Steel common 40, preferred 99½; Railway Spring common 38; Republic common 34½, preferred 98½; Sloss-Sheffield common 74; Cast Iron Pipe common 21½, preferred 74½; Can common 10, preferred 73½.

Dividends.—The Niles-Bement-Pond Company has declared the regular quarterly dividend of 1½ per cent. on the common stock, payable June 20, and 1½ per cent. on the preferred stock, payable May 16.

The United States Cast Iron Pipe & Foundry Company has declared the regular quarterly dividend of 1¾ per cent. on the preferred stock, payable June 1.

The Pressed Steel Car Company has declared the regular quarterly dividend of 1¾ per cent., payable May 25.

A Large Order for Koppel Steel Coal Cars

One of the largest orders of its kind placed this year, comprising over 1000 cars, has recently been given to the Orenstein-Arthur Koppel Company, whose works are at Koppel, Pa., and general offices at Pittsburgh, by the Jamison Coal & Coke Company, Greensburg, Pa. The cars are to be used in the new mines recently opened by this company in the Westmoreland field. The coal company has been experimenting for several years with all makes of coal cars with the view of securing actual data relative to the life, maintenance opened by this company in the Westmoreland field. The coal company has been experimenting for several years with all makes of coal cars with the view of securing actual data relative to the life, maintenance and transportation costs of the several kinds, and the placing of this order is the result of the experiments.

The cars to be furnished are of special design, of all steel construction, with cast steel wheels and roller bearings. Each is to be of 100 cu. ft. capacity. The order, which is but one of many recently received by the Koppel Company, represents an outlay of several hundred thousand dollars. This means double turn work at the Koppel plant for several weeks, due to the pressure of this and other urgent orders.

Philadelphia Associated Foundry Foremen.—The regular monthly meeting of the Associated Foundry Foremen of Philadelphia was held on the evening of May 10 in the Odd Fellows' Temple, with President C. R. Brown in the chair. There was an exceptionally large attendance, both of local and out of the city members, due no doubt to the paper presented for discussion, which was on "Permanent Molds," by E. A. Custer, of the Tacony Iron Works, Philadelphia. The question of suspending meetings during the summer was discussed, and it was decided to adjourn until the regular meeting in October. It was determined, however, that an outing be held during the summer months, and the Entertainment Committee was instructed to make the necessary arrangements. Resolutions of regret were adopted on the deaths of George Ellicott of the Southwark Foundry & Machine Company, and James J. Connell, general superintendent of the Link-Belt Company. Mr. Custer's paper covered briefly the experiments made before the practicability of the process was established, and showed by lantern slides the types of molds and the castings produced. A motion picture film was also used to show the actual work performed in the process of making cast iron pipe fittings. Numerous sample castings illustrated points in his address. A spirited discussion followed, in which many points of interest to the foundry foremen were brought out.

The Lawson Mfg. Company's Changes.—The Lawson Mfg. Company, Chicago, announces that W. H. Bennett, who has been the executive head of the company for some years, and whose efforts in that capacity have met with gratifying success, is retiring from the connection because of his removal to California. Mr. Bennett had previously become widely known throughout the Western hardware trade by reason of his long representation of the Reading Hardware Company. William J. Gold succeeds Mr. Bennett in the management of the Lawson Mfg. Company. Owing to the rapid growth of its trade the company has considered the removal of the factory from Racine to Chicago advisable, and a location has been secured at 215 West Huron street, where an installation has been made of new and thoroughly up-to-date machinery. Under expert supervision, the manufacture of Matchless hinges and other hardware will be greatly facilitated.

The Engineers' Society of Western Pennsylvania held a house warming party in its new quarters on the twenty-fifth floor of the Henry W. Oliver Building, Smithfield street, Pittsburgh, Pa., on the evening of May 7. The new quarters of the society are admirably arranged, being larger and more convenient in every way than its former quarters.

The Knoxville Iron Company, Knoxville, Tenn., states that the report is absolutely without foundation that it is enlarging its operations by the erection of additional buildings.

The Machinery Markets

The demand for machinery from the railroads is better throughout the country. Inquiries are good in the East, and the Pennsylvania Railroad has issued a large list for requirements, which are to be installed in its shops west of Pittsburgh. There is some scattered railroad buying in Chicago against lists that have been out for several months, and it is reported in that market that the Allis-Chalmers Company has received a $3,000,000 order from the Indiana Steel Company for equipment for its Gary plant. A good demand for foundry machine shop equipment has developed in Pittsburgh, and the requirements cover a wide range. The railroads are also more active in that territory. On the south Pacific coast there has developed a demand for drilling and pumping equipment, in addition to general machine shop requirements from the oil producing industries which have become quite active. In Milwaukee the machinery market has settled down for the time being, and standard apparatus is ordinarily specified. The demand for special machinery which existed a few weeks ago is not so great, but activity in the iron ranges gives promise of good trade in the future. In the Northwest most of the machinery business comes from private corporations for power, lighting and heating plants, and in the Central West the activity in flour mills and grain elevators is bringing some business. In the South business is somewhat variable. The quarries have been good purchasers of hoisting equipment, conveying machinery and stone working machinery, and some power business is in sight from hydroelectric plant enterprises. Reports from Cleveland and Cincinnati are optimistic. In the latter city business is especially good, and there have been good sales of heavy machinery for working sheet metal. The demand for conveying machinery in that territory is heavy, and some manufacturers report that last month an especially big business was done.

New York

NEW YORK, May 11, 1910.

A large list of machine tools has been sent out by the Pennsylvania Railroad, covering requirements for shops west of Pittsburgh, and most of the New York houses and New York machinery representatives who have received inquiries have referred them to their Western representatives, as it is understood that the business will be handled from that territory. The list will cover requirements for an expenditure exceeding $50,000, according to estimates made by those who have received specifications. The New York, New Haven & Hartford Railroad has a list out calling for about $25,000 worth of machinery, and some good orders have been placed in this territory by the Ingersoll-Rand Company for its Phillipsburg shops. The William Cramp & Sons Ship & Engine Building Company has had a small list out for some time, and a number of houses in the Manhattan territory have received orders of late from that source. It is understood that the list covers requirements for additions to the shop equipment rather than for new manufacturing extensions. The New York Central Railroad has not as yet placed any orders here against the large list issued a few weeks ago. Business in the general machinery line in the New York territory is good and the railroads seem to be taking more interest in machinery matters. Some good sized orders have been placed for single tools by a number of roads, and inquiries now coming in go to show that there will be further buying. Some good business has been done by the power people, and those who specialize in hydroelectric equipment have been given orders, a large part of which are for increasing the capacity of existing hydroelectric plants.

The Haitian Government has given notice that it has ratified an agreement with J. P. McDonald, the railroad contractor who has his main offices at 42 Broadway, New York, and others for the construction of 400 miles of railroad in Haiti which will cost several million dollars. The railroad will run from Gonaives to Hinche and Grosmore, and from Port au Prince to Cape Haitien and Arcahare. It is understood that part of the line will extend through a large mineral and agricultural field. It has been known in railroad circles in New York for some time that Mr. McDonald and his associates were trying to get a franchise to build the road, but the late President of Haiti is said to have opposed it. The ratification by the new Government makes the project possible, and this will probably result in the purchase of a large amount of railroad equipment. It is stated that the preliminary engineering details will be worked out at the New York office of Mr. McDonald.

The stockholders of the American Brake Shoe & Foundry Company, 30 Church street, New York, have authorized the increase of the capital stock from $6,000,000 to $10,000,000, of which $5,000,000 is to be preferred and $5,000,000 common stock. The stockholders will have the privilege of taking 10,080 shares of the increased preferred stock at $105 a share in proportion of 18 per cent. of holdings. It is the intention of the company to purchase the plants of the Featherstone Foundry & Machinery Company and the National Brake Shoe Company. All preliminary steps have been taken and contracts drawn up for taking over the properties of the companies named.

The United States Motor Company, with offices at 505 Fifth avenue, New York, has completed plans for the erection of a large plant at Detroit, Mich., for manufacturing commercial vehicles exclusively. The main building will be 150 x 1000 ft. and will have several additions, including a foundry. A portion of the plant will be one story, while other sections will be two stories high. It is also stated that the plant of the Alden Sampson Mfg. Company, Pittsfield, Mass., which has been taken over by the United States Motor Company, will be enlarged and the output of heavy duty trucks will be very much increased.

The trade in this territory is watching the Public Serice Corporation in New Jersey. This company is preparing to build large machine shops at Market street, Newark. Nothing has been heard of the machinery requirements in this vicinity as yet and it is said they have not been purchased.

The Art Metal Works, 9-12 Market street, Newark, N. J., was practically destroyed by fire May 4. The company manufactures art metal goods, such as plated clocks and ornaments, souvenirs, &c. Most of its machinery was destroyed and it is stated that new equipment will be got together as soon as possible. Louis D. Aronson is president and general manager of the company.

Considerable conveying machinery and power equipment will be installed in a sugar warehouse which is to be built at Plymouth and Jay streets, Brooklyn, by Arbuckle Brothers. The structure will be 200 x 210 ft., and 10 stories. It will be of reinforced concrete throughout and the general contract for the construction has been awarded to the Turner Construction Company, 11 Broadway, New York.

The Board of Water Commissioners, Perth Amboy, N. J., will receive bids until May 18 for two 200-hp. water tube boilers, to carry 175 lb. steam pressure. These boilers are to be installed in the plant at Runyon, N. J. A. H. Crowell is superintendent of the board at Perth Amboy.

Among orders booked by the Garwood Electric Company, New York, for equipment to be installed in the new Whitehall Building, New York, are three 300-kw., 220-volt, direct current generators, with a speed of 100 rev. per min., and one 150-kw. generator, 110 rev. per min. The company also sold the Brewster Carriage Company, Long Island City, four 150-kw., 250-volt generators, with a speed of 150 rev. per min.

The New York, Auburn & Lansing Railroad Company has been organized at Ithaca, N. Y., for the purpose of developing electricity for light and power purposes. The company will take over an existing plant to which some improvements will be made. A. H. Flint is president; H. A. Clark, secretary and treasurer. The general offices are at 100 Tioga street.

The old Somerset Distillery at East Millstone, N. J., has been taken over by Abram Marcus of New Brunswick, N. J., and it is stated that the property will be occupied by the Harmer Rubber Reclaiming Works.

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The Towanda Lumber Mfg. Company has plans under way for locating a large lumber mill at Towanda, Pa.

William F. Marresford, whose office and factory are located at Pearl and Water streets, Brooklyn, has acquired a site at Easton, Pa., and is contemplating establishing a factory at that point for the manufacture of special paper machinery.

The Vulcan Steam Forging Company, Buffalo, N. Y., will build an addition to its plant at Rano street and the Delaware, Lackawanna & Western Railroad, 50 x 120 ft., doubling its capacity. A portion of the equipment has been purchased, including a 1600-lb. steam hammer. A medium power bulldozer will be required.

The Uraniumite Company of America has been incorporated at Buffalo, N. Y., capitalized at $400,000, to manufacture metal alloys, chemicals, &c., and will build an extensive plant in Buffalo or immediate vicinity, with executive offices in Buffalo. The directors are William L. Bechtold, Arthur H. Hunter, John H. Smith, Horace C. Mather and Harre E. Nichols.

The item appearing in *The Iron Age* of April 28 stating that "the Niagara Electro-Chemical Company, D. E. Parker, president, Niagara Falls, N. Y., was arranging to build an addition to its plant," was erroneous as to the name. The item should have stated that the Parker Electro-Chemical Company of Niagara Falls, recently organized, is arranging to built a manufacturing plant. D. E. Parker, president of the newly formed company, was formerly connected with the Niagara Electro-Chemical Company.

The Clark Motor Company has filed incorporation papers at Buffalo, N. Y., with a capital stock of $50,000, and will engage in the manufacture of electric automobiles. Arrangements are being made to establish the plant of the company at Buffalo. The directors are Stanley B. De Long, superintendent of the Pierce plant of the American Radiator Company; John W. Van Allen and Henry J. Rente, Buffalo.

The Hope-Jones Organ Company of Elmira, N. Y., is to remove its plant to North Tonawanda, N. Y., within a few weeks, where it will occupy a part of the Rudolph Wurlitzer Mfg. Company's musical instrument manufacturing plant. About 200 skilled workmen and their families will move from Elmira to North Tonawanda.

The Oswegatchie Mfg. Company, Buffalo, N. Y., is building an addition to its silk mill on Grosvenor street, which will double its capacity. A large amount of special weaving machinery will be required.

The Board of Water Commissioners, Niagara Falls, N. Y., will receive bids until May 20 for construction of the filtration plant to be built in connection with the new water works system.

The E. & B. Holmes Machinery Company, Buffalo, N. Y., is building a one-story brick addition to its plant on Chicago street.

An engine driven electric generating unit of 200 kw. or over, with some additional apparatus, will be installed in the power house of the King Sewing Machine Company's plant at Buffalo, N. Y.

The Central Foundry Company—including its subsidiaries, the Central Radiator Company and the Central Iron & Coal Company—has removed its general offices to 90 West street, New York.

The Rogers-Brown Iron Company, Buffalo, N. Y., has let the contract for the ore bins and larries at its new blast furnace plant, at South Buffalo, to the Brown Hoisting Machinery Company, Cleveland.

Catalogues Wanted

The Gelsenkirchener Bergwerks-Actien-Gesellschaft, Esch an der Alzette den, Luxemburg, desires catalogues relating to modern iron and steel works equipment.

Chicago

CHICAGO, ILL., May 10, 1910.

The Chicago machinery market is on the upward swing again and considerable improvement is noted in any comparison with the business done last month. Inquiries are more general and while the trade is scattered the business done is considered satisfactory by most of the Chicago houses. There are no large deals being closed, but the return of spring weather has produced a more cheerful feeling throughout the West. The dullness which has been reported in the market was undoubtedly a sympathetic condition, following the peculiar conditions that have prevailed in the iron and steel using industries. The decline in pig iron and in the stock market has naturally led many business men to pursue a cautious policy. These things have always been supposed to coincide with a reaction in general business conditions and buyers have shown a hesitation in forward contracts for pig iron and steel. The same feeling would lead many of them to hesitate in making investments in new tools, notwithstanding the fact the business actually being done in all iron and steel products is on a very large scale. It would seem as though this hesitation is wearing off in other directions as well as in the machine tool business, and if this view of the trade is correct a steady improvement may be expected in the next month or two, as buyers are likely to resume their forwarding contracting for materials in the near future and will necessarily decide upon their plans for improvements and replacements.

One of the Chicago houses was somewhat surprised recently to receive an order for boring mills from the Oregon Short Line. This order was an acceptance of bids submitted on a list sent out by this railroad more than six months ago. Apparently no purchases have been made on this list until recently. Hopes are now entertained that some business may develop from the lists of the Chicago, Burlington & Quincy, the Chicago & Northwestern and the Great Northern Railway, which have been pending three or four months. If the railroads do not place their business soon they may be disappointed in the deliveries to be obtained. On boring mills deliveries now run from three to six months from the date of the order.

The Buda Company, Harvey, Ill., whose business is now chiefly the manufacture of automobile parts, is in the market for a small list of tools amounting to about $10,000.

The Velie Motor Vehicle Company, Moline, Ill., recently bought a list of about 20 tools from Chicago houses.

It is reported, not officially confirmed, that the Allis-Chalmers Company has booked a $3,000,000 order from the Indiana Steel Company for the engines and generators for the second power plant to be built at Gary, Ind. This plant will generate about 40,000 hp. and will consist of 10 units. Each unit is composed of a generator and four 44 x 60 in. cylinders, using blast furnace gas. Work has begun already on the foundations for this plant, which will supply power to the subsidiary industries which are locating at Gary.

The Northwestern Gas Light & Coke Company, Chicago, has purchased a tract of ground containing 20 acres and will erect a new plant at a cost of about $300,000.

The Iowa Central Railroad Company has commenced work on an addition to its shops at Marshalltown, Ia., which will be used as a tin shop and tool room.

The Great Northern Railroad Company has let a contract for the erection of a new coach repair shop at its Jackson street yards in St. Paul, Minn., to cost about $60,000.

The Chicago Steel Foundry Company, Rookery Building, Chicago, is in the market for an air compressor, with chippers, pneumatic chipping hammers and miscellaneous cleaning room equipment.

A committee composed of J. L. Darness, Charles P. Hornaday and others at Danville, Ind., is interested in a proposition to bring to that city a factory for the manufacture of a patent window frame and window especially adapted to ventilating and sanitary requirements. All necessary stock has been subscribed and work is expected to commence soon.

The Fort Wayne Electric Works, Fort Wayne, Ind., is building a tunnel between its power plant and foundry building 725 ft. long, 4 ft. wide and 5 ft. high, in which will be installed heating pipes, live steam pipes and return condensation pipes and power and lighting wires.

The Chicago Drop Forge & Foundry Company, Chicago, is having an addition erected to its plant 75 x 92 ft. Patterson & Davidson, 98 Jackson boulevard are the engineers in charge.

The Union Drawn Steel Company, Chicago, has purchased the property at the northwest corner of Kinzie and Jefferson streets, which it will improve by the erection of a steel warehouse.

Arthur J. O'Leary & Son, Chicago, jobbers of iron and steel, have purchased from the Chicago Clearing Land Association five acres on Sixty-fifth street and will erect a warehouse building 80 x 300 ft., with a clear hight of about 30 ft., to which four additional rooms will be added at right angles, each 60 x 200 ft., at a cost of about $100,000.

The American Cash Register Company, Columbus, Ohio, is contemplating removal to a more favorable location and the erection of a new plant of larger proportions than the one now occupied.

The Commercial Club, Terre Haute, Ind., is negotiating with two automobile companies with a view to securing their removal to that city.

The Apperson Brothers Automobile Company, Kokomo, Ind., has broken ground for the erection of an addition to its factory which it expects to have ready for occupancy in about three months.

The Anderson Tool Company, Anderson, Ind., has under way and nearly completed the following additions: Measur-

The Machinery Markets

ing room 50 x 90 ft.; warehouse 50 x 70 ft.; storeroom 40 x 80 ft., and an addition 50 x 80 ft.

Chickering Brothers, Chicago, manufacturers of pianos, have secured an option on a tract of land where they propose erecting a new factory.

Beall Brothers, Alton, Ill., is increasing the size of its warehouse at Marion, Ill., where it carries a large supply of miners' tools.

As a result of its recent decision to install a steam turbine generating unit of 2000 kw., the Evansville Gas & Electric Light Company, Evansville, Ind., will dispose of two alternating current dynamos of 250 kw. each, three phase, 60 cycles, 2300 volts, together with auxiliary apparatus. They have been operated as belted units.

A plant will soon be in course of erection on the outskirts of Joliet, Ill., for the Joliet Concrete Machinery Company, recently organized.

The National Hydraulic Tire Setter Company, Keokuk, Iowa, whose plans for a new factory in one of the suburbs of Springfield, Ill., were recently mentioned, has the building now under way.

A three-story factory 60 x 125 ft. and machine shop 100 x 100 ft. will be built at Steger, Ill., by the Steger & Sons Piano Mfg. Co.

The Stover Engine Works, Freeport, Ill., will soon complete an addition to its plant to be used in the manufacture of gasoline engines.

The Canton Gas & Electric Company, Canton, Ill., recently announced that it was in the market for a direct current generator of 25 kw. to be used as an exciter.

The Mansfield Engineering Company, Indianapolis, Ind., will have in charge the construction of a hydroelectric plant for the Bedford Power Company on the south fork of the White River, near Williams, Ind. Plans and specifications are now being prepared.

The proposition to build a pumping plant at Carpentersville, Ill., which was submitted to a popular vote, has been rejected.

The Ingersoll-Rand Company announces the removal of its Chicago office from the Old Colony Building to the People's Gas Building, suite 1503-7, 150 Michigan avenue.

The engine house of the Taylorville Gas & Electric Company, Taylorville, Ill., was totally destroyed by fire May 3. The estimated loss is $10,000.

The Marshall-Huschart Machinery Company, Chicago, is erecting a new factory, 80 x 160 ft., three stories.

The Hayes Pump & Planter Company, Galva, Ill., is having plans prepared by Raeder & Wood, 77 Jackson boulevard, Chicago, for a manufacturing plant, including a four-story warehouse, foundry and shop changes.

The Chicago Railways Company, Chicago, is awarding contracts for the erection of a new power house.

James C. Curtis & Co., Chicago, is having erected by Patterson & Davidson, 98 Jackson boulevard, Chicago, a six-story and basement factory building, 100 x 180 ft.

The Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind., is preparing preliminary plans for a power house, to contain power for its own operation and the Indianapolis City electric lines.

The Vacuum Ice Engineering Company has been organized at South Bend, Ind., with $100,000 capital stock, to build artificial ice plants. The incorporators are S. A. Knoblock, William F. Eger and C. S. Taylor, South Bend, and Howard Hallock, Baltimore, Md.

The Sullivan County Electric Company has been incorporated at Sullivan, Ind., with $60,000 capital stock, to supply power and light. The directors are M. E. Nebeker, H. C. Dies, C. M. Poor, David McBeth and J. W. Robb.

The Logansport Heating Company, Logansport, Ind., has been incorporated with $125,000 capital stock, to supply municipal heat. The directors are Bert Wills, E. C. Murtry, Markwood Sliper, C. S. Wise and Frank McKistler.

The Commercial Club of Danville, Ind., has raised by subscription $15,000, as part of the total capital stock of $100,000 of the Cowie Frame, Sash & Lock Company, which will establish a factory there to manufacture a patent window and frame. Lew W. Cooper, Leonard W. Quill and Gordon Cowie of Indianapolis are the principal stockholders. The building and machinery for the proposed plant will cost $20,000.

The Stone City Cut Stone Company will erect a mill at Bedford, Ind. The company, just organized, has $15,000 capital stock. The incorporators are Gustav Steiglitz, George W. Gretzer and Adolph Meissner.

The contract for construction of waterworks and pipe line at Boonville, Ind., has been awarded to Foster & Raiser, Union City, Ind., at $18,865.

James A. Quinlan and Michael T. Hanly, Muncie, Ind., are planning the erection of large boiler works in that city.

The Automatic Gas Igniter Company has been organized at Indianapolis, Ind., and incorporated with $35,000 capital stock, to manufacture gas igniters. The directors are John L. Lawn, Charles W. Mitchell, Charles E. Kerschner and Frank L. Alford.

Philadelphia

PHILADELPHIA, PA., May 10, 1910.

Quieter conditions are reported in practically all branches of the trade; inquiries as well as orders come out with less frequency, and the whole market shows a tendency to drag. A good share of the hesitancy displayed by prospective buyers is attributed by both merchants and manufacturers to the somewhat uncertain conditions in general business. The railroads continue to withhold their usual machinery programmes, but come into the market occasionally, mostly for single or small lots of tools for early delivery. The Pennsylvania Railroad sent out an inquiry of this character during the week covering an engine lathe, a turret lathe, a drill press and an automatic tool for Jersey City delivery. Very little has recently developed from the other roads in this immediate vicinity. The larger industrial concerns enter the market sparingly and irregularly, although there is a slightly better tendency toward expansion on the part of some of the smaller plants, the machinery requirements for which have not yet come up for serious consideration.

Manufacturers of machine tools are yet pretty fully engaged, and in a general way orders on hand are sufficient to keep plants engaged for some time ahead, so that any slight let-up would not inconvenience them to any extent. Builders of heavy tools, as well as those of a special nature, have more work ahead than those making a specialty of the smaller class of equipment, for which the demand has not been so urgent. Somewhat better inquiry for power equipment is to be noted, with a further better volume in sight.

Immediate deliveries of machinery and tools do not improve very much, owing, it is said, to delayed deliveries of raw materials. Castings are in many cases difficult to obtain promptly, particularly steel castings, makers of which continue to note a demand greater than they are able to supply. Gray iron castings can be had more promptly, as business in this branch of the trade has not been so active.

The demand for second-hand machinery and general equipment is not particularly active, merchants reporting but a fair day to day inquiry.

The Gray Iron Foundry Company, Reading, Pa., has had plans prepared and will shortly erect a three-story concrete manufacturing building, 24 x 100 ft., with an addition, 24 x 54 ft. One floor of the building will be used for a general machine shop; other portions will be used for power purposes, polishing and grinding departments, general assembling departments and storage. A 100-hp. Corliss engine is to be installed and later on additional machine tool equipment will be required for its enlarged machine shop.

The plan of modernizing and rehabilitating its various mill buildings and equipment progresses steadily with the Reading Iron Company, Reading, Pa. One of the improvements under this plan is the new brick and steel building for its No. 6 pipe mill in its tube works department, which is now practically completed. This mill will be used for the manufacture of the larger sizes of wrought iron pipe, from 12 to 20 in. in diameter. One 25-ton and two 10-ton Niles-Bement-Pond electric traveling cranes will be installed. The general equipment for the mill is being manufactured in its own Scott foundry department.

The Espen-Lucas Machine Works, formerly located at Broad and Noble streets, has about completed the removal of its plant and office to its recently acquired plant at Girard avenue and front street. This concern reports business as very satisfactory, particularly the demand for tools of the heavier types, that for the smaller tools being somewhat easier.

The General Chemical Company, with offices in the Bourse Building, has acquired an 80-acre tract of land below Chester, Pa., being desirous of obtaining a water front site for future expansion in this territory. Nothing definite has been decided upon regarding the erection of a plant, but it is understood that the company will ultimately build a large factory on a part of the tract.

On May 3 fire destroyed a portion of the plant of M. L. Shoemaker & Co., Ltd., manufacturers of fertilizers, oils and tallows, at Venango street and the Delaware River, Philadelphia. Plans for rebuilding have not yet been determined upon.

It is stated the contract for the new garage for the Auto Car Company at Twenty-third and Market streets has been awarded to James G. Doak & Co., contractors. The building will be fireproof and measures 105 x 120 ft. Stearns & Castor are the architects and engineers.

The Chantrell Hardware & Tool Company, Reading, Pa.,

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will begin the work of erection in a few days on a one-story manufacturing building 60 x 80 ft., and a second-story addition 60 x 300 ft., to one of its present buildings. These improvements have been made necessary by its constantly increasing business, and when completed will increase its capacity 25 per cent. The new building will be used principally by its lock and builders' hardware departments. Increased facilities for plating and finishing will also be installed.

The Penn Chain Works, Reading, Pa., will build a one-story addition, 20 x 50 ft., so as to increase its capacity by 10 fires. This company notes a heavy demand for hand forged chains ¼ to 1¼ in. diameter, and will increase its facilities at an early date for this class of work.

The Carpenter Steel Company, Reading, Pa., following the plan of centralization for the storage of materials, has under course of erection a one-story and basement raw material storage building, 80 x 100 ft., with railroad sidings, elevators, oil storage system and other conveniences for the economical handling and storage of materials. It will also erect shortly a new building to be used for pickling purposes. This company is running its plant at full capacity and reports business conditions very favorable.

The Textile Machine Works, Reading, Pa., is now erecting a new power plant, the capacity of which will be about 1000 hp. A Nordberg cross compound engine, direct connected, with a Fort Wayne generator, will be installed. The contracts for all the necessary appliances are understood to have been placed.

The Standard Gas & Electric Company, Philadelphia, was incorporated recently under the laws of Delaware with a capital of $24,000,000. The incorporators were Joseph P. Murray and Edgar E. McWhiney of Philadelphia. The concern is empowered to manufacture and generate electricity and gas for heating, lighting and power purposes. The company is not prepared to make any statement regarding its plans.

The Bergdoll Motor Car Company, which operates a large garage at Broad and Wood streets, is considering the erection of an addition on property adjoining, which it purchased some time ago.

The Nelson Valve Company, Wyndmoor, Pa., has begun work on the erection of a new steel foundry, pattern shop and pattern storage building, particulars regarding which will be available at a later date.

The pumping station of the Philadelphia Gas Company, near Ford City, Pa., was destroyed by fire May 7. It is reported that two engines of 800 hp. each and seven boilers were badly damaged.

New England

BOSTON, MASS., May 10, 1910.

Observers whose experience extends back over many years assert that never has there been a time where such extremes prevail in the degree of prosperity among manufacturers. The condition of business in shops, factories and mills varies from an extreme tension of effort resulting from an insistent market to a dullness which compels a reduction of working hours. The extremes are not so great in the metal industries as in some others; few concerns in the former lines are not running with a normal working force, while the average of business is very good. But even where orders reach satisfactory figures during a month they come in streaks. As one machine tool builder puts it, some days the mails contain promising business while telegraph orders punctuate the hours. Between these days, however, are others when there is practically nothing to do on the order books. The market is extremely uneven; it has not settled down into its gait.

The manufacturers are receiving word from their dealers in the Middle West that the automobile builders are making preparations for purchasing the machinery required for 1911. Doubtless they see the necessity of taking time by the forelock, if they are to get deliveries of machinery for use a year hence. The automobile trade has so depleted certain lines of tools that only very early orders will give buyers the equipment with which to build next year's product. Confidence is expressed that this trade will this season have the same very great influence that it has exerted for several years. It will certainly buoy up the machine tool market until the demand for equipment shall become more general.

The Universal Machine Screw Company, Hartford, Conn., manufacturer of multi-spindle screw machines and machine screw products, has awarded the contract for its new shops at Hartford, on Windsor street extension. The main building will be 117 x 200 ft., one story, with saw-tooth roof, with wings for the boiler room, storage and shipping rooms, case hardening plant and office. The plant will be operated by electric power, purchased from the local power company. Largely increased facilities will be afforded, not only by additional space as compared with the present shops, but in enlarged equipment.

The Portland Electric Company, Portland, Maine, has purchased the property of the Publishers' Paper Company at Bonny Eagle and Limington Falls, and will develop large hydroelectric power for transmission to Portland, where it will be used for manufacturing and lighting purposes.

The Bosch Magneto Company, 223-225 West Forty-sixth street, New York, is making inquiries which indicate large purchases of machinery for the new plant which will be built at Springfield, Mass., already mentioned in these columns. The list will consist mostly of small sizes of tools, but requirements will be for a high grade of workmanship. The initial unit of the works, situated on a tract of land containing seven acres, will be a large building, of reinforced concrete, and this will be duplicated as a series of structures later on. The company manufactures magnetos for automobiles, motorboats, motorcycles, stationary gas engines and airships.

The Belknap Mfg. Company, Bridgeport, Conn., manufacturer of brass goods for steam, gas and water, will build an addition to its works, 25 x 83 ft., one story, to permit of increased facilities for the production of valves and specialties.

The Woonsocket Machine & Press Company, Woonsocket, R. I., will build an addition to its foundry, 65 x 150 ft., one story, to be used in increasing the molding floor space.

The business of the Beaton & Bradley Company, New Britain, Conn., will hereafter be conducted as the Beaton & Cadwell Mfg. Company. Allan J. Beaton, the president, and William H. Cadwell, the secretary and treasurer, will continue as officers, no change in management or policy attending the change in name. In order to take care of increasing business the capital stock has been increased to $50,000. The company manufactures floor and ceiling plates, floor sleeves, pipe hangers and steam specialties.

The Hopkins & Allen Arms Company, Norwich, Conn., has purchased the machinery, patterns, stock and patents of the W. H. Davenport Firearms Company of that city, and has engaged the services of W. C. Davenport, the former manager of the latter company. The Hopkins & Allen Company will manufacture the Davenport line in conjunction with its own.

Additions to general manufacturing plants outside of the metal lines include the following: C. D. Borden, Fall River, Mass., cotton goods, new mill to contain 108,000 spindles; Kibbe Bros. Company, Springfield, Mass., confectionary, addition, 30 x 42 ft., six stories; Pelley Toilet Paper Company, Fulton, N. Y., mill at Springfield, Mass., 50 x 100 ft.; National Biscuit Company, Newark, N. J., factory at Hartford, Conn., 60 x 170 ft., one story; Muller Gloria Silk Mills, Norwalk, Conn., new mill building; Ideal Concrete Machinery Company, South Bend, Ind., plant at Uxbridge, Mass., for the manufacture of concrete blocks; Rossie Velvet Company, Mystic, Conn., addition to boiler room; Hills Company, Amherst, Mass., addition, 90 x 145 ft., four stories, for which 200-hp. engine and boiler will be installed; Worcester Muslin Underwear Company, Worcester, Mass., four-story addition, 50 x 60 ft.; Nonotuck Silk Company, Florence, Mass., addition, 55 x 85 ft., three stories; Warren Cotton Mills, Warren, Mass., two-story addition to cost $30,000.

The Burrows Lock, Nut & Bolt Company, Boston, will establish works at West Gloucester, Mass., for the manufacture of bolts, nuts and Burrows patent lock nut. A shop building will be erected, 48 x 80 ft., two stories, the contract for the foundation being already let. The list of requirements in the way of equipment is not ready, plans not having matured to that point. H. L. Hannaford is the treasurer of the company.

Ground has been broken for a new building for the Dunbar Bros. Company, Bristol, Conn., manufacturer of springs. The structure will be 30 x 80 ft., three stories. It will be ready for occupancy in August.

The Parker Motor Company, Hartford, Conn., has increased its capital stock from $50,000 to $100,000. The company states that while cash capital has been put into the business, very little new machinery will be purchased at this time.

The Neddo Pneumatic Tool Company, Barre, Vt., has been organized to manufacture the Neddo patent automatic lewises, the corner blocks for chain stone, and a new surfacer which is being perfected and a new pneumatic polishing machine adapted for polishing stone which hitherto has had to be treated by hand. P. A. Neddo is the president, J. O. Bilodeau vice-president, and E. N. Normandeau treasurer. The company will not immediately establish shops. For a few months the product will be looked after by an outside manufacturer. It is the intention to build a factory a little later.

The new plant of the Osgood Bradley & Sons Company, Rochester, Mass., is practically completed and is receiving its equipment of machinery. It constitutes an important

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addition to New England's industries, for the growth from the old shops, vacated in the abolishment of the city's grade crossings, is equivalent to large works. The location is at Greendale, where the shops form another unit in a notable group of factories which have grown up in the last decade, including, in the metal lines, the Norton Company, the Norton Grinding Company, the Heald Machine Company, the Morgan Spring Company, the Worcester Pressed Steel Company and the Greendale Gas Engine Company. The Bradley Company will employ 800 men in the beginning, and that force will be increased to about 1200 in a few months. It will build passenger cars only, both steam and electric. The purpose is to add steel cars to the line. The works are to the New York, New Haven & Hartford Railroad as a source of supply of passenger cars what those of the Keith Car Mfg. Company, Sagamore, Mass., are in the freight car end of the equipment. The affiliations of the companies and the railroad are close, insuring a constant and large market for the products. The main building of the Bradley plant consists of three aisles. The center is 90 x 420 ft., with 50-ton traveling crane, for the building of steam passenger cars. The ground floor of the north aisle, 100 x 460 ft., contains the woodworking shop; the second floor the cabinet shop and other departments. The south aisle, 90 x 440 ft., houses the machine shop and blacksmith shop, and will be devoted to the manufacture of trucks. The paint shop for the steam cars is about 75 x 280 ft., that for the electrics 90 x 280. A general manufacturing building is 40 x 224 ft., a power plant 60 x 140 ft., and there are large buildings for offices, dry kilns and lumber storage.

The Eastern Machine Screw Company has been incorporated in Connecticut to manufacture machine screws. The capital stock is $100,000. The incorporators are Norris S. Lippitt, Norwich, Conn., a prominent banker; Walter S. Garde and Solomon Youngman, Hartford; Robert O. Eaton, North Haven, Conn., and J. Henry Roraback, North Canaan, Conn. Mr. Lippitt is the president; the vice-president is William Gates, Norwich, while Joseph E. Hubinger, New Haven, is the treasurer. The company is to use a new screw machine, the invention of Mr. Gates, who is well known in Norwich as a machine designer, his former connection being with the Hopkins & Allen Arms Company of that city. The list of stockholders includes many well-known Connecticut manufacturers. The location of the factory is not decided upon, a committee of the directors now having the matter under consideration.

The F. E. Reed Company, Worcester, Mass., has purchased land adjacent to its works, but does not plan to build on the premises, the purpose being the removal of buildings which might be a menace in case of fire.

The North & Judd Mfg. Company, New Britain, Conn., manufacturer of saddlery hardware, will build an addition to its brass foundry 60 x 105 ft., and an addition to its annealing room 70 x 94 ft.

The plant and drop forging business of the Roren Drop Forging Company, Providence, R. I., has been taken over by the Union Mfg. & Drop Forge Company, which will concentrate its energy on general drop forge work only. The Roren Company will not discontinue the manufacture of Bullard and other wrenches, as was stated in *The Iron Age* of March 24, but has made arrangements to take care of this industry in the same factory.

Pittsburgh

PITTSBURGH, PA., May 10, 1910.

The market for foundry, boiler and machine shop equipment has developed considerable strength, and sales cover a wider range than at any time for six or eight weeks prior to this month. This condition is partially due to increased advertising and the drumming up of trade by some of the leading manufacturers and dealers of the district, who were a good deal behind on orders for quite a long period and have not cared until recently to make an aggressive campaign for further business. In part, however, the growing volume of purchases must be ascribed to a greater diversity of demand. Railroads are gradually coming into the market for more and more machinery, including shop tools for all purposes; and large industrial interests which have, for the past two or three months, been backward in buying, are again making their needs felt. A great many estimates are being called for.

It is interesting to note that the sale of apparatus for transmitting power by mechanical means, as distinct from electrical, tends here to become almost completely concentrated in the hands of dealers, relatively few inquiries now being sent from this district directly to manufacturers. Of late, this feature of the trade has been particularly noticeable. Good stocks of shafting, belting, pulleys, &c., are carried by the leading supply houses and nearly any requirement of a customer can be promptly filled. Electrical equipment is working toward the same trade channels, but still remains principally under the direct control of manufacturers, except for the smaller sizes and standard detail apparatus.

Through representatives of large construction companies it is learned that final plans for the building of quite a number of important traction lines, with practically complete specifications for machinery and material used in power stations, transformer houses, &c., are now nearly ready, and that some important contracts for equipment, as well as road building, will be let soon.

The water works system at Williamson, W. Va., will be largely extended and improved. Equipment details have not yet, however, been definitely determined upon.

The Bellefontaine Foundry & Machine Company, Bellefontaine, Ohio, has estimated on more steam dredges recently than for any similar period in past seasons, indicating that the demand for machines to be used in heavy work in various parts of the world is becoming very extensive. This company, although in business for only seven or eight years, has developed a large trade in its specialty.

The new plant of the Pittsburgh Motor Car Company, Pittsburgh, recently referred to, which is located at Braddock, Pa., will be pushed to completion early in the coming summer. Some of the equipment required has been provided for, but a good deal of it will not be needed until after the first shop unit has been finished. The present plant of the company may be disposed of.

A water supply system, including pumping plant, is being planned at Frostburg, Md., where construction has been authorized.

Among sales recently made by the Lima Locomotive & Machine Company is one reported from Orange, La., where the Miller-Link Lumber Company has just put in service a 55-ton locomotive from the shops of that concern.

The Epping-Carpenter Company, Pittsburgh, finds that the extraordinary activity in building and improving power plants now manifested creates a large demand for steam pumps of the various types and sizes used for this service.

A new pumping station and mechanical filtration plant will be constructed at Waynesboro, Pa., during the latter part of this year. Among the requirements of the immediate future are two triplex steam pumps of the direct acting type.

The Heisler Company, St. Mary's, Ohio, is putting on the market a vacuum pump for condenser service, which can be fitted, if desired, with a Corliss steam cylinder, dashpots and valve gear designed for economical cut-off.

Two motor generator sets of 200 kw. each will be installed this summer by the Lewisburg, Milton & Wasontown Passenger Railroad Company, Milton, Pa.

The New Martinsville Electric Light, Heat & Power Company, New Martinsville, W. Va., which now has a steam plant of 500 hp., including alternating current generator of 175 kw. driven by a Skinner engine, will install gas engines to operate on natural gas. The main office of the company is at Wheeling, W. Va.

A low pressure turbine of 1500 kw., to operate on the exhaust from Corliss engines already installed, will be added to the plant of the Wheeling Traction Company, Wheeling, W. Va., increasing its capacity to 3500 kw. The contract has practically been let.

The Erie City Iron Works, Erie, Pa., has considerably extended its business this season in the Pacific Northwest. Among recent installations is one of two large high pressure boilers set in the power plant of the Multnomah Box & Lumber Company, Portland, Ore.

Plans were recently completed for the enlargement of the municipal power plant at Martin's Ferry, Ohio, which now contains alternating current generators of 400 kw. capacity driven by steam engines. It is proposed to spend about $25,000 improving and extending the present equipment.

W. Edgar Reed, consulting electrical engineer, 1312 Machesney Building, Pittsburgh, is sending out specifications for bids covering boilers and electrical machinery required in the municipal light plant at Martin's Ferry, Ohio, which he is designing. The desired equipment includes water tube boilers of 600 hp., engine and generator units of 250 and 400 kw., of 2200 volts, for incandescent and arc lighting, and power, switchboard and probably some new additional arc lamps.

W. L. Clause, president of the Pittsburgh Plate Glass Company, says that the loss by the fire at No. 4 works, Ford City, Pa., is $600,000. The company carries its own insurance and has a reserve account of about $300,000, which will offset one-half of the fire loss. The plant will be immediately rebuilt.

Samuel W. Hays' Sons, Pittsburgh, representing the Whiting Foundry Equipment Company, have received a contract for an overhead trolley or monorail system in the plant of the Union Switch & Signal Company, Swissvale,

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Pa., which includes 1500 ft. of track, beams and switches.

The Clinton Iron & Steel Company, Pittsburgh, is installing two heavy duty blast furnace blowing engines, built by the Southwark Foundry & Machine Company, Philadelphia.

The Vulcan Crucible Steel Company is making some improvements at its plant, at Aliquippa, Pa., and has placed an order with the Bessemer Gas Engine Company, Pittsburgh, for a 110-hp. gas engine, a Westinghouse generator, motors and a switchboard.

The Pneumelectric Machine Company of Syracuse, N. Y., maker of the Pneumelectric coal puncher, announces that its Pittsburgh office is now in the Oliver Building, room 2328.

The Wheeling Metal & Mfg. Company, Wheeling, W. Va., manufacturer of sheet metal specialties, states that the recent fire in its plant, which is at Glendale, near Wheeling, was not so serious as reported, only one building being damaged. The loss was not over $5000. Contracts have been placed for the rebuilding and equipping of the burned building.

The Pittsburgh Construction Company has awarded a contract to the Ingersoll-Rand Company, New York, for an equipment of air compressors and rock drills for use on section 53 of the Catskill aqueduct, New York.

A. Frecker, formerly connected with the Pittsburgh office of the Charles A. Stickney Gas Engine Company, has organized a company to engage in the manufacture of a line of gas engines at Wheeling, W. Va.

The American Glass Specialty Company, Monaca, Pa., has commenced the erection of an addition to its plant, 44 x 60 ft., of cement block construction. This new building is to replace its shop and engine room which was destroyed by fire several months ago.

Cincinnati

CINCINNATI, OHIO, May 10, 1910.

Machine tool builders report an entirely satisfactory opening for May and an increase of inquiries all along the line. Trade with the dealers also shows an appreciable increase, and sales of heavy machinery for working sheet metals and the better grades of heavy conveying machinery have been excellent. Automobile lathes are having a good sale with manufacturers in this market. Some who make a specialty of that tool are booked ahead as far as September. One large manufacturer of tool specialties in this market reports May so far the best month for several years. The mails of Monday contained the lists of the Delaware, Lackawanna & Western and the Pennsylvania railroads, both for needed tools, which assisted in the optimistic feeling.

In a number of establishments the forces have been increased and practically all are on a 55-hour per week schedule. Reports from the manufacturing districts in Indiana, West Virginia and northern Ohio are also favorable. A large manufacturer of overhead conveying machinery in Ohio writes that business is good and prospects exceedingly bright. He says actual buyers are quite numerous and orders are being placed without hesitation, and so far as he can see conditions have rarely, if ever, been better than at present. This concern has made large additions and improvements in the past year and has equipped its shops with the best tools in the market. Machinery and equipment calculated to keep pace with the many changes in this field from coal and other fuels to natural gas are also having an excellent sale.

Next week the semiannual meeting of the National Gas and Gasoline Engine Trades Association convenes in Cincinnati at the Hotel Sinton, the dates being May 13 to 16, inclusive. Those in charge expect the sessions to have the largest attendance and to be the most interesting in the history of the organization. A large number of papers will be read. There will be arranged several trips of inspection through the various machine tool plants of Cincinnati and an unusually fine exhibition of auxiliaries and parts will be made in a large room adjoining the convention hall at the Hotel Sinton.

Another important convention to be held this month in Cincinnati is the twenty-first annual meeting of the Ohio Society of Mechanical, Electrical and Steam Engineers, which will be from May 19 to 21, inclusive. Inspection trips are arranged for each day to some large plant, including the new water works, and there will also be a number of important papers. Hotel Sinton will be headquarters.

At one of the quarterly gatherings of the Cincinnati Metal Trades Association some time ago the subject of the new Ohio Mechanics' Institute Building, donated by Mrs. Thomas Emery, came up as a part of the programme. Mention was made of the promise of several machine tool engine and equipment builders that when the new building was ready to be furnished several companies would donate certain tools or equipment. These concerns are located in various parts of Ohio, and the directors of the Institute, it is stated, will confine acceptance of these donations of equipment to Ohio makers, because the institution is peculiarly a State product. However, there is no local organization as yet intended to take the initiative in the equipment matter, and there is not likely to be any until the building is nearly ready for the equipment. At present the foundations are but recently started on the new site at Canal and Walnut streets.

The Ohio Pattern Works Company, located in the Spring Grove avenue tool manufacturing district, will build an addition to its plant. Work will be commenced at once.

The Victor Lamp Company, which has recently moved into its new plant at Camp Washington, will erect an addition of four stories from plans in preparation by Architect Martin Fisher. The addition will be built on the east side of Sassafras street, west of Colerain avenue, and will be 97 x 100 ft.

A new incorporation at Canton, Ohio, is the Canton Sheet Steel Company. David B. Day is prominent in the organization.

The stockholders of the Seneca Chain Works, which was recently destroyed by fire at Kent, Ohio, have decided to rebuild the plant, and it will depend on an agreement to take $50,000 of the preferred stock as to what city will get the plant. The stockholders decided to issue $300,000 preferred stock. Both Alliance, Ohio, and Kent are competing for the new plant, and it is understood that work of construction will go forward immediately it is determined what city shall be the scene of future operations.

Cincinnati and Hamilton capitalists are interested in a new scenery hoisting apparatus, for the manufacture of which an entirely new plant is to be built in one of the southern Ohio cities. The company has just been capitalized at $150,000, with O. M. Bake, Ben Strauss, John Eberson, T. J. McCarthy and J. T. Ward of Hamilton, Ohio, interested along with the inventor and patentee of the device, C. J. Spillman of Sidney, Ohio, and Milton Herzman and N. W. Thompson, also of that city. Mr. Spillman is superintendent of the Sidney Tool Company. The new device is a combination of electrically driven powerful hoisting machines for manipulating stage scenery and appliances. It belongs in the class of labor savers, taking the place of a great number of stage hands.

A new factory addition is being built in London, Ohio. The Ohio Metallic Specialty Company, a $50,000 corporation, has, it is said, decided to join the West Mfg. Company and the Kinnel Edge Tool Company in the new manufacturing district being laid out in London. The Ohio Metallic Specialty Company will manufacture pressed steel in all its forms—sheet metal ceiling, ornamental grate and summer fronts, stamped lockers for factory and office use, and also a line of filing cabinets and office furniture.

The Hamilton Caster Mfg. Company is a new incorporation for Hamilton, Ohio, with a capital of $10,000, by Carl A. Weigel, Caroline Weigel, Louise Weigel, A. Krogman, Julia Krogman.

The Union Fork & Hoe Company, Columbus, Ohio, is reported to be planning the erection of a new factory addition on Dublin avenue, for which contracts are being let.

The B. F. Freeman Company is a new organization for Columbus, Ohio, with offices in the Ruggery Building. The new company, of which B. F. Freeman, formerly general manager of the Columbus Structural Steel Company, is the head, will also act as Columbus representative of the Bruner system of sidewalk lights, the Consolidated Expanded Metal Company and the American Steel & Wire Company. The company has also taken up a new material for the inside finishing of buildings, known as Vitrolyte.

Cleveland

CLEVELAND, OHIO, May 10, 1910.

The demand for machine tools has improved in this market since the first of the month. Local machinery houses report a fair amount of business during the week and a better volume of inquiries. While no large lists have come out, orders are not limited to single tool propositions so much as they were and dealers are working on several inquiries ranging from $3000 to $10,000 worth of tools. The general condition of the market may be said at present to be about normal. Business is well scattered among manufacturers in metal working lines. The demand from the automobile trade continues light. The large automobile manufacturers have bought so heavily during the past few months that they are not expected to be heavy buyers for some time, although a good demand is looked for from new companies that are still entering the field. The demand for lathes has improved con-

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siderably. The inquiry for bolt machinery continues active. Orders for presses are also quite plentiful. The call for automatic machinery is good and deliveries are getting further behind.

Dealers expect a good business from manufacturing companies that are planning new plants and extensions. There is considerable work of that kind either under contract or contemplated in this territory. Extensions include enlargement projects by some of the larger manufacturers of automobile parts. Some of these are being held up until new contracts are secured from automobile manufacturers for their products.

In electrical equipment the outlook for a fair demand from interurban traction companies during the next few months is quite promising. Little has been done in the way of extending traction lines in this territory during the past two years and new equipment in most cases has been provided only where absolutely necessary. Traction companies are now showing a disposition to buy new equipment and some new projects are under consideration.

The demand for second-hand tools is active, but only a limited number are being placed on the market.

L. E. Ewing, 2041 East Ninetieth street, Cleveland, has purchased the plant of the Findlay Axe & Tool Company, Findlay, Ohio, as a site for an automobile plant which will be operated by a new company which will be incorporated with a capital stock of $300,000, under the name of the Findlay Motor Company. Touring cars and delivery trucks will be manufactured. The company will buy at the start machine tool equipment to the amount of $50,000 to $60,000. This machinery will be purchased for as early delivery as possible. Mr. Ewing was the organizer of the Ewing Automobile Company, Geneva, Ohio, builder of taxicabs.

The Owen Steel Crane Company, Cleveland, has been incorporated, with a capital stock of $25,000, to build portable grab bucket cranes intended principally for contractors and railroads. The company expects to establish a manufacturing plant, plans for which have not yet been perfected. The incorporators of the company are Owen W. Callahan, James J. Egan, J. F. Rollings, Frank E. Callahan and James J. Callahan.

The Board of Trade and the Business Men's Association of Canton, Ohio, have inaugurated a movement to raise funds to secure the location of new manufacturing establishments in that city. In carrying out their plan they have purchased a 100-acre tract of land in the southwestern section of that city, which will be laid out in lots. An expenditure of $20,000 in improvements is planned and the lots will be sold. Business men not desiring to purchase lots will be asked to make cash subscriptions. The campaign will be started May 19 and continue for eight days.

The Grant & Wood Mfg. Company has been organized in Michigan to make a new automatic machine, the invention of J. J. Grant, formerly of Cleveland, and a line of special machinery. The company has acquired a stove plant in Chelsea, Mich., which will be occupied for manufacturing purposes. Toolroom equipment is now being purchased for the plant. The company has offices at present at 320 Woodward avenue, Detroit. E. E. Wood, formerly of the Walcott & Wood Company, Jackson, Mich., is the manager.

The Taplin-Rice-Clerkin Company, Akron, Ohio, maker of ranges and hot air furnaces, has commenced the erection of an addition to its plant, 50 x 50 ft., four stories. This will be used for a storage room and a power plant. A 250-hp. gas engine will be installed, contract for which has been placed.

The Cleveland Drop Forging Company announces that its plant, which was recently nearly destroyed by fire, will be rebuilt at once. The machine shop escaped the flames. The presses and hammers were damaged, but will be repaired. The plant will be rebuilt on a larger scale. A fireproof building, 50 x 80 ft., will be erected. Some new machinery will probably be purchased.

It is announced from Mansfield, Ohio, that the Hughes Supply Company, which has been incorporated with a capital stock of $300,000, will take over the wholesale business of the Humphryes Mfg. Company, pump manufacturer. George D. Hughes, who has been with the Humphryes Mfg. Company for six years in charge of the wholesale department, will be the manager of the new company, and associated with him as incorporators are C. M. Hughes, F. A. Hughes, M. E. Hughes and Joseph Michael. The new company has secured quarters in the Schambs Building, 208-210 North Main street.

The Hess-Snyder Company, Massillon, Ohio, maker of pulleys, furnaces, pumps, &c., will enlarge its plant by the erection of a foundry 80 x 162 ft., on which work has already started. Up to date equipment will be provided, including a 10-ton electric crane.

The Canton Sheet Steel Company, Canton, Ohio, has been incorporated, with a capital stock of $500,000, by D. B. Day and others. This is a concern backed by Pittsburgh and Eastern capitalists that has agreed to build a plant in Canton provided the Board of Trade pays a portion of the cost of a site.

The Maumee Electric Company, Toledo, Ohio, of which James S. Ashley is president, has completed improvements to its water power plant at Miami, Ohio, and announces that it will now go ahead with the erection of a new plant at Grand Rapids, Ohio. Generators will be installed that will give this plant a capacity of 1500 hp., making a total capacity of 3500 hp. in the two plants. The power will be sold in Toledo for manufacturing purposes.

The Dusseau Motor Company, Toledo, Ohio, has been incorporated, with a capital stock of $30,000, by S. V. Dusseau of Monroe, Mich., and others, to manufacture a new motor car, the invention of Mr. Dusseau. The company intends to establish a plant in Toledo.

The Kittoe Tank & Boiler Company, Canton, Ohio, which recently increased its capital stock from $25,000 to $50,000, announces that it is not planning any plant extensions at present, a larger amount of capital being provided because of the growth of the company's business.

The A. B. C. Castings Company has opened its new plant at 6515 Carnegie avenue, Cleveland, for the manufacture of aluminum, bronze and copper castings. Among the company's products will be a metal known as "aerial metal," intended for use in the construction of airships. It is claimed that the specific gravity of this metal is less than pure aluminum, and that it has a tensile strength of 25,000 lb.

The Osborn Engineering Company, Cleveland, has completed plans for a new plant for the Firestone Tire & Rubber Company, Akron, Ohio, for which bids will be received in a few days. The plant will be 260 x 360 ft. in area, with four stories and a basement. The building will be of steel and concrete. A large amount of special machinery used in the manufacture of automobile tires will be required. The Firestone Company will also build a new power plant, for which plans have not yet been prepared.

The company that will build a new steel foundry in Sandusky, Ohio, has been organized under the name of the Farrell-Cheek Steel Foundry Company. Contracts have been let for the plant, which will be 100 x 100 ft., with an office building 25 x 25 ft. George W. Doersbach & Brother, Sandusky, have been given the general contract. T. H. Brooks & Co., Cleveland, were awarded the contract for the structural steel. The Cleveland Crane & Engineering Company, Wickliffe, Ohio, has secured the contract for a traveling crane.

Detroit

DETROIT, MICH., May 10, 1910.

While the automobile trade and its related lines still constitute the largest single sources of demand for new equipment, dealers are more generally occupied than heretofore with inquiries from manufacturers in widely varied lines, particularly those whose output consists of special machinery for use in some of the country's principal industries. Practically all of these have had as much business as their shop facilities permitted, since early last fall, and many are now planning increased production for the coming season. Inquiries at present are largely tentative, being made with the object of arriving at the cost of projected additions or improvements; but a fair percentage will develop into orders within the next two months, so as to provide for installation of machinery by fall.

The demand for fabricated iron and steel products, as well as mechanical equipment used in construction work, is becoming more prominent from one week to another. Great attention is paid by builders to labor saving devices and more work for the same number of men employed is being accomplished this season than ever before. As manufacturers in this section cater so largely to that class of trade, the general machinery market has been stimulated accordingly.

Attention should also be directed to the recent growth in export trade, which is another field in which automobiles built at Detroit, Toledo and neighboring cities have led the way for more extensive introduction of other articles of manufacture. The effect is said to have been especially pronounced with reference to machine tools, forging outfits &c., on account of the reputation gained abroad by the motor car plants of this section as models of operating efficiency. However, there has been a gain in foreign business along many lines. One of the largest manufacturers of machinery estimates it at 17 to 18 per cent. of his total production, with rising tendency. To a considerable extent this trade is being carried on in co-operation with reliable export houses and European dealers; but direct sales are not infrequent.

The Hanchett Swage Works, Big Rapids, Mich., has

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thus far this season found trade in the South and Southwest particularly good.

The Russel Wheel & Foundry Company, Detroit, has taken contract for a combination skidder and loader to be used by the Alex. Gilmer Company, Jasper, Tex., who is erecting a new timber cutting plant. Wickes Bros., Saginaw, Mich., will furnish some of the machinery for the mill.

The Clarage Foundry & Mfg. Company, Kalamazoo, Mich., whose business this year shows considerable gain over any previous season, has secured as general superintendent Frank McMurdie, who has heretofore been for many years in charge of the American Blower Company's plant at Detroit.

The American Steam Pump Company, Battle Creek, Mich., reports an active demand for the Marsh simplex pumps which it is manufacturing. Self-regulating valves are a feature of this type.

The city of Sturgis, Mich., has let contracts for a hydroelectric power unit of 500 kw. capacity, with accessory equipment, which will be installed during the summer. There are now in the municipal plant two Fort Wayne generators, engine driven, which develop 250 kw.

The Winona Copper Company, Winona, Mich., is installing a new steam stamp mill for ore crushing.

The project for an electric power plant at Charlotte, Mich., to be operated by the municipality, will probably reach a favorable issue early this summer, so that machinery can be purchased and installed by October 1.

The Wood Electric & Mfg. Company, South Bend, Ind., is building gasoline engines up to 50 hp., which are especially designed for use in construction work, including the operation of hoists, air compressors and mixers, as well as small dynamos for electric service. This type is known as the Wemco engine.

The Indianapolis Grille Company, Indianapolis, Ind., will build a new factory 50 x 150 ft., two stories, and add some machinery to its present equipment.

The National Steel Casting Company, Montpelier, Ind., has had plans drawn for an addition to its foundry.

The R. Z. Snell Mfg. Company, South Bend, Ind., will double the capacity of its plant, in order to keep up with the demand for concrete mixers.

An unusual feature of the low pressure turbine to be installed in the power plant of the Quincy Mining Company, Hancock, Mich., as recently mentioned, is the fact that it will take exhaust steam from the hoists, which are used in termittently. In order to keep the supply steady a regenerator will also be installed.

Additional electric motors will be installed in the near future by the Rapid Motor Vehicle Company, Pontiac, Mich., to provide for operating new machinery.

The manufacturing facilities of the Marquette Motor Car Company, Saginaw, Mich., are to be considerably enlarged this season. Definite announcement of plans will be made later.

Benjamin Middleditch, 89 Meldrum avenue, Detroit, has plans prepared and will let contracts for the construction of a foundry building 60 x 120 ft.

The American Lubricator Company, Detroit, has had plans prepared by M. R. Burrowes, 703 Trussed Concrete Building, Detroit, for a two-story factory building 131 x 200 ft.

R. E. Raseman, architect, 1314 Penobscot Building, Detroit, is preparing plans for factory buildings for the manufacture of automobile parts and will be ready for bids about June 1.

The Detroit Shear Company, Detroit, recently mentioned, contemplates the installation of five additional hammers some time in the near future.

Milwaukee

MILWAUKEE, WIS., May 10, 1910.

The market for machinery and tools of every description has apparently settled down, for the time being, to a quiet, steady demand. Standard apparatus is ordinarily specified, the tendency toward special machines, which was noted some time ago, having again subsided. Manufacturers and dealers generally are of the opinion that the present favorable conditions will continue, except for occasional fluctuations, throughout the remainder of the spring and early summer, and that August will witness heavy buying for fall delivery.

Activity on the iron ranges which has been much more pronounced this season, so far as Wisconsin and upper Michigan are concerned, than for some years past, seems destined to play an even larger part in next year's business. A great deal of development work has recently been inaugurated and considerably more will be started during the summer and fall months. This means initial orders for power-driven outfits of various kinds, including compressors, drills and hoists, with more extensive installations in the spring of 1911. In the copper country conditions are very similar, except that the demand for equipment comes mainly from a number of the oldest mines in the district, which are adding very largely to their facilities.

It should also be borne in mind by manufacturers and dealers that the augmented prosperity of the north country has resulted in a general industrial awakening which leads to the establishment of numerous small plants, a considerable percentage of which are devoted to the metal working trades. A side line of increasing importance is automobile repair work. Motor cars are coming into such general use in the mining and timber districts that adequate provision has to be made for their maintenance; and, as local shops are able to get high prices for this work, they have gone into it to a surprising degree. Eventually it will have considerable effect upon the tool market, particularly in the line of second-hand equipment, the influence of buying from this source being already felt in nearby centers.

Early in the year the quarries of this State made what their owners or lessees considered ample provision for a heavy season's output; but in probably the majority of cases the apparatus recently put in operation hardly suffices to meet the requirements of the demand for stone to be used for building and road making. Crushing plants, especially, are proving inadequate; and there have been so many breakdowns lately in the older portions of plants, as the result of the severe service to which they have been subjected, that manufacturers are overwhelmed with orders for repair work.

Opportunities for the sale of water turbines, dynamos and other equipment used in hydroelectric plants, are again becoming numerous. Most of these are in the line of relatively small developments, and inquiries some largely from engineers of municipalities which have under consideration the erection of plants for lighting service. The idea of utilizing the power of rivers and even small streams has become so prevalent in this State, as a result of the agitation which recently attended a legislative investigation of the subject, that Wisconsin is likely to become, within a brief period, one of the leading fields of development of hydraulic plants.

The only condition existing at present which causes manufacturers any apprehension is the growing scarcity of skilled labor. A good many men are being brought in gradually from Europe, but only in such a manner as to avoid any violation of the contract labor laws, namely, through favorable reports made by relatives of these men who are now working in the shops of the State. Factories located in the smaller cities are finding this problem the hardest to grapple with. They are solving it as far as possible by increasing use of automatic machinery, by bonus systems and by special attention paid to the training of new recruits, those who operate on the principle of the open shop having, as a rule, very much less difficulty than is the case where the unions rule.

Oglebay, Norton & Co., Commonwealth, Wis., are completing a large steam power plant, including Corliss engine, air compressor and hoist. All of the machinery required at present has been provided for, but some auxiliary apparatus will be needed later.

The Downey & Kruse Company, Milwaukee, whose loss by fire was reported some time ago, has moved into new quarters at 613-615 Clybourn street, where it has a well equipped machine shop and steam fitting plant. This company also carries a full line of engineers' supplies and is prepared to fill all orders as heretofore.

The Sterling Wheelbarrow Company, whose new plant at West Allis, Wis., gives it greatly increased facilities for production, has built up a very large trade this season among contractors and others engaged in construction work, the activity in which has given great impetus to this line of business. It will probably not be long before shop additions are required.

The McDonough Mfg. Company, Eau Claire, Wis., has installed one of its improved type of resaws in the plant of the Multnomah Box & Lumber Company, Portland, Ore.

The Lyon Boiler Works, De Pere, Wis., which will find it essential to provide more extensive manufacturing facilities if the demand for boilers of its manufacture is to be met, is reported to be planning the erection of a new power plant. Considerable of the equipment can be furnished by the company itself.

A hydroelectric plant of considerable capacity, embodying low-head impulse turbines and direct connected dynamos, may be constructed this summer near Crivitz, Wis., by the Crivitz Pulp & Paper Company of that place. It will, however, be some weeks yet before definite plans can be evolved.

The Superior Iron Works Company, Superior, Wis., has among its specialties this year a very compact and at the same time powerful steam anchor hoist for use on ore carriers, dredges and other vessels docking at the Twin

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Ports. The engines have 6 x 6 in. cylinders, with throttle reverse, the lifting power being regulated by a change in the gearing to suit conditions.

Contracts are about to be let for the power and electrical equipment of the new building of the Northern Paper Mills, Green Bay, Wis.

It is expected that the plant of the Lindermann Box & Veneer Company, Eau Claire, Wis., which recently burned, will be rebuilt for larger capacity and equipped with electrically driven machinery.

The Reliance Iron & Engine Company, Racine, Wis., is offering to the trade a portable gasoline engine, manufactured in sizes from 1½ to 25 hp., which can be belted to light machinery in any location, being excellently adapted to farm and contractors' work.

The Ashland Light & Power Company, Ashland, Wis., has acquired the Gogebic Electric Light Company's power plant at Bessemer, Mich., and will remodel it, installing apparatus for transforming and utilizing current from the hydroelectric development on the White River. The engine driven generating units now installed at Bessemer will probably be retained as a reserve.

The D. L. Murray Mfg. Company, Wausau, Wis., has taken the contract for the principal machinery to be installed in the new plant of the Milwaukee Lumber Company at St. Maries, Ida.

The Globe Seamless Steel Tube Company, said to be of Chicago, has secured a site on the southwest border of Milwaukee and will erect a large plant. Temporary offices are to be located on land leased from a local real estate company, and the work of building the plant is to be completed before fall.

A large machine shop, with forging outfit and boiler making tools included, will be built here shortly for the use of the fire department, whose present facilities for repair work are considered inadequate. The selection of a site is now under discussion.

Use is being made on the iron ranges of a new all steel frame dump car, which is built by the Russel Wheel & Foundry Company, Detroit, Mich. This has a number of features of construction which render it extremely well adapted for handling ore, particularly in connection with steam shovels.

The new generator and electrical apparatus for the enlarged municipal power plant at Black River Falls, Wis., will be furnished by the Fort Wayne Electric Co., Fort Wayne, Ind.

The new 12,000,000 gal. pumping engine which is being built at West Allis for the North Point Station, Milwaukee, will be placed in service four to five months ahead of contract time.

Another hoisting plant is to be constructed by the Barkhausen Coal & Dock Company, Green Bay, Wis., in connection with its unloading facilities on the water front.

Contract for the new hydraulic turbine to be installed by the La Crosse Water Power Company, La Crosse, Wis., has been let to the S. Morgan Smith Company, York, Pa. The dynamo will be of the General Electric Company's build.

Work will begin in the near future on several of the new buildings which the Mitchell-Lewis Motor Company, Racine, Wis., are planning. These include a central power house and a drop forging plant. Most of the equipment required is understood to have been already arranged for. Other construction work will be undertaken as needed.

Machinery is being installed in a large addition to the plant of the Anson-Gilkey-Hurd Lumber & Mfg. Company, Merrill, Wis., which will begin operations shortly.

Bids are being taken on a new three story factory for the Paragon Oil & Supply Company, Oshkosh, Wis. No equipment is needed at this time.

A contract has just been let for electric motors to operate machinery in the new plant of the Automatic File & Index Company, Green Bay, Wis.

The Reliance Engineering & Equipment Company, Milwaukee, has been engaged to prepare plans for the installation of a pressed steel wheel plant which will be erected this summer at an Indiana point. The machinery is purchased.

In the extension of the Mandt Wagon Company's works at Stoughton, Wis., one of the buildings provided for will be a forge shop, 160 x 180 ft., built of steel and brick.

A press report from Portage, Wis., states that the Freeland Steel Tank Company is running full force, with a large amount of work ahead, notwithstanding the fact that it is a comparatively new concern. Among orders for tanks recently taken is one for shipment to Brazil, South America.

The Racine Gas Engine Company has decided to remain in Racine, Wis., and will erect a new two story factory building 50 x 75 ft.

The Wisconsin Engine Company, Corliss, Wis., is preparing to enlarge its manufacturing facilities, in order to meet the present demand for its power, rolling mill and pumping engines as well as other products. A new pattern and storage shop 120 x 160 ft. will be built during the summer.

Sealed proposals will be received by J. W. Leverich, Chairman Building Committee, of the insane asylum at Sparta, Wis., until May 17, for the erection and completion of a boiler house, central heating plant, laundry and plumbing.

The Harley-Davidson Motor Company, Milwaukee, is having plans prepared for an addition to its machine shop.

The Western Machine Mfg. Company, Eau Claire, Wis., has leased a plant in that city for the purpose of making patterns, special tools, jigs and samples for the manufacture of two styles and four sizes of farm gasoline engines. The company will erect a new factory which it expects to have completed at the expiration of its lease on its present building.

The Racine Iron & Wire Works, Racine, Wis., is erecting a factory building, 45 x 109 ft., three stories and basement, with an addition 28 x 33 ft., one story, to be used as a plating and polishing room. The company will use its present gas engine for power. In the basement will be installed the shipping room, forges and boiler for steam heating purposes. The first floor will be utilized as office, machine shop, buffing room, plating and tinning, while the second floor will be used for the manufacture of wire work, weaving brass and copper cloth, wire guards, fences, desk railings, elevator cabs and bank fixtures. It is the intention of the company to add from time to time such new machinery as its business demands.

The Johnson Service Company, Milwaukee, at its twenty-fifth annual meeting of stockholders, authorized an increase in its capital stock from $1,000,000 to $1,500,000 and the purchase of a site for the erection of a new automobile factory. It is the intention of the company to push the manufacture of heavy auto trucks and light delivery wagons in the future.

The Cutler-Hammer Mfg. Company, Milwaukee, Wis., and Kohler Brothers, Chicago, have made an arrangement whereby the former company will hereafter manufacture and market for the latter in the United States and Canada the various types of push-button operated controllers comprised in the Kohler system of electric control. For the purpose of carrying this arrangement into effect all data, records, &c., pertaining to the Kohler system have been transferred to the Cutler-Hammer Company, and that company has also retained the services of the men who have been handling this branch of business.

St. Louis

ST. LOUIS, May 9, 1910.

Leading dealers in metal working machinery state that the volume of business, while somewhat larger than it was at the corresponding time a year ago, is hardly up to their expectations, owing in part to the limited purchases by railroads in this section. Some business goes East through the bunching of orders, which are given to companies that are in a position to underbid in filling the entire list. Complaint is made of great delay in obtaining machinery, which tends to divert business to second-hand machinery, for which as a result there is considerable demand. Dealers are carrying good stocks and assortments.

Gas engines are now commanding more attention than for several years. A leading house recently placed an order with the St. Marys Machine Company, St. Marys, Ohio, for a 70-hp. 40-kw. duplex engine. The order for the generator was placed with the Burke Electric Company, Erie, Pa.

The Webb City & Carterville Foundry & Machine Works, Webb City, Mo., has found business particularly good this season in the line of mining and ore reduction machinery for all of the principal producing sections of the near and far Southwest. Concentrating plants are a specialty of this concern.

The plant of the Lufkin Light & Power Company, Lufkin, Texas, which contains two Warren alternating current generators and other machinery aggregating about 200 kw., will be enlarged and improved, having recently passed under the control of new interests.

Bids will be taken until May 25 by W. S. Shields, Hartford Building, Chicago, on a steel storage tank of 60,000 gal. capacity and mechanical equipment for a water and sewage system, including engine driven electric power unit of 75 kw., pumps, &c., for Searcy, Ark.

The Fred Messmer Mfg. Company, St. Louis, will erect an addition to its machine shop 28 x 154 ft.

Advices from Fort Worth, Texas, state that a new company known as the Multi Electric Mfg. Company is about to establish a plant there for the production of motors and other electrical apparatus. Definite particulars are lacking.

The Houston-Bay Shore Traction Company, Houston, Texas, which was recently organized to build a traction line

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to La Porte, Texas, 23 miles distant, will erect at the latter place a large electric power house. The details of machinery equipment have not yet been worked out.

G. W. Mattison, Carthage, Mo., who handles for the Southwestern territory the internally fired boilers built by the S. Freeman & Sons Mfg. Company, Racine, Wis., has found this season's business very active.

An electric power set for lighting and other service will probably be installed this summer by the Lancaster Milling Company, Lancaster, Texas.

The Tofte Boiler & Sheet Iron Works, Houston, Texas, has been called upon this season for a great deal of tank work, for which there seems to be more than ordinary need in connection with various industries throughout the Southwest.

The Granby Mining & Smelting Company, Oronogo, Mo., has installed two pumping plants on new ground, which it will proceed to develop, necessitating the purchase of some additional equipment later on.

E. J. Gully, Prescott, Ark., has placed a new boiler in his saw mill near that city.

The installation of a municipal electric plant is proposed at Tipton, Mo., but no definite action to that end has as yet been taken.

The Brunner Water & Light Company, Brunner, Texas, is about to erect a new electric power and pumping plant.

Machinery for a new timber cutting mill, including boiler, engine and power transmission apparatus, is being installed near Glenwood, Ark., by A. V. Alexander of that place.

The St. Louis Southwestern Railroad is taking active measures toward the building of boiler, forge, wood working and machine shops, as well as an electric power plant, at Argenta, Ark. The site, however, will have to be secured by condemnation proceedings.

It is reported from Benton, Ark., that the Benton Light, Power & Ice Company, which now operates a Warren alternating current generator of 60 kw., engine driven, will build a new power plant of enlarged capacity.

A gas engine unit of 300 hp. was recently placed in continuous service at the Cementville plant of the San Antonio Portland Cement Company, San Antonio, Texas, and another of the same size will be added.

The Little Rock Handle Company, Little Rock, Ark., is making improvements in its plant, which include the installation of a new boiler and engine. Additional buildings are also to be erected.

The Dallas Terminal Railway & Union Depot Company, Dallas, Texas, will build extensive yard facilities and a roundhouse in South Dallas.

The Northwest

ST. PAUL, MINN., May 9, 1910.

The market for machinery continues fairly active, with sales mostly in small lots and scattered over a wide expanse of territory. Buying has gravitated more towards the North and comes more largely than usual from isolated districts where new industrial operations or developments of various kinds are in progress.

Among standard lines of equipment the most pronounced activity exists with respect to steam boilers, including an uncommonly large number of replacements due to wear and the use of higher pressures than were formerly considered safe. As a rule, each sale involves so much other apparatus that it runs up into considerable money, and there is very lively competition for the business among both manufacturers and dealers. The bulk of it appears to have been going lately to local shops.

Purchasing for the account of private corporations operating power lighting and heating plants, as well as municipalities, will also be quite general along all lines from now until about August 15, or later, as the need is felt of greatly increased facilities for the winter of 1910-11. During the past season many public service stations proved inadequate to the demands made upon them. The fiscal year of some companies ends June 30, and most of these are putting off buying until after that time, as it will still give them ample opportunity to make installations before cold weather again sets in, and maintenance charges last winter were so excessive as to compel rigid economy for as long a period as possible in order to pay the customary dividends. This is a factor which machinery manufacturers and dealers in supplies of various sorts should take into consideration.

Collections at present are reasonably prompt, but money is tightening as the result of preparations now being made to take care of the remainder of the old crop and provide for the movement of the new. This mainly concerns the market for agricultural machinery and implements, but other lines are affected and will be in increasing proportion from this time forward.

The city of Anoka, Minn., which now operates an old fashioned electric plant purchased some years ago from a private corporation, will build a new power house and substations equipped with modern machinery. A steam turbine unit is likely to be included.

The American Hoist & Derrick Company, St. Paul, whose increase in manufacturing facilities was recently referred to, is putting out a combination machine which can be used as track layer, tie or log loader, steam shovel, ditching and ballasting machine or pile driver.

The construction of a water supply system, with steam or gasoline engine driven pumps, is under consideration at Brandt, S. D.

A municipal public service plant, including pumping station, will be erected this summer at Raymond, Minn., a bond issue for the purpose having recently been voted.

The Northwestern Copper & Brass Works, St. Paul, Minn., is placing its new Victor heater in mills all over the country and some increase of manufacturing facilities will probably be necessitated before the end of the present year.

There is an opportunity at Chamberlain, S. D., for the purchase and improvement of an electric plant now held by the Chamberlain Investment Company. The present outfit consists of a Pelton turbine wheel of 150 hp. driving a Westinghouse alternating current generator, and other apparatus.

It is reported, without confirmation, that the Universal Tractor Company, Crookston, Minn., whose plans for rebuilding were recently mentioned, will become merged with the Northwestern Thresher Company, Stillwater, Minn.

Machine tools for a repair department may be required by the Duluth Automobile Company, Duluth, Minn., in connection with a new garage to be built this summer.

A new water tube boiler, pumping engine and elevated steel reservoir will probably be purchased this year at Chisholm, Minn., in accordance with the recommendation of the city's engineer, who has prepared plans for the extension of the water works system.

The Watertown Steel Tank Company, recently organized, is providing for a modern manufacturing plant at Watertown, S. D.

A new industry just established at Wahpeton, N. D., is that of the Northwestern Sheet Metal & Iron Company, whose products, in addition to what its name implies, will include steel culverts.

A new substation is to be erected in Minneapolis shortly by the Minneapolis General Electric Company.

The Great Northern Railway is about to begin erection of a new shop in connection with its repair works at St. Paul. The building permit provides for a structure to cost $40,000, its dimensions being given as 200 x 200 ft.

The South Park Foundry Company, St. Paul, has taken a fabricating contract of considerable size for the city of Chisholm, Minn.

Pumping machinery may be required in the near future at Mandan, N. D., as construction of a better water supply system has been actively taken in hand by the municipal authorities and results may be expected soon.

A large gyratory rock breaker has been purchased by the city of Two Harbors, Minn., for a municipal crushing plant. This will lead to other requirements along the same line.

The contract for electrical equipment of substations, in connection with the hydraulic power system of the Minidoka, Ida., project of the United States Reclamation Service, has been awarded the General Electric Company, Schenectady, N. Y.

The Nabob Mining Company, Wardner, Idaho, will put in service an air compressor operated by gasoline engine, preparatory to further development work which will necessitate the purchase of considerable additional machinery later on.

The Fisher Creek Mining & Smelting Company, Cabinet, Mont., which has a 10-stamp mill, is preparing to resume operations that were suspended some years ago and will probably require some further equipment in the near future.

The Northern Pacific Railroad Company is preparing to increase its division maintenance and repair facilities at Wallace, Idaho, including the erection of a new roundhouse.

O. W. Anderson, whose offices are in the Masonic Temple, Minneapolis, has organized the Standard Implement Company, which will manufacture certain patented specialties in the line of agricultural machinery. A factory is to be built this coming summer either at Minneapolis or in one of the other industrial communities of southern Minnesota.

Reports recently published, to the effect that the Pence Automobile Company would erect a manufacturing plant in Minneapolis on a tract 150 x 230 ft., which has been acquired, are not correct. This may be done later on, but at present the site will be utilized for a warehouse.

The American Ornamental Iron & Bronze Company,

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Minneapolis, is having extensive alterations made in the foundry and shop buildings recently secured for its business, and modern equipment will be installed.

Sealed bids will be received by the Mayor and Town Board of Allerton, Iowa, until May 17, for furnishing and installing the following material for the construction of an electric light plant: One 80 b.h.p. producer gas engine for belt driving alternating current generator; one producer gas outfit complete of sufficient size to drive above engine; one 50 kw. generator belt driven, switchboard, arc regulators, arc and tungsten lamps, poles and line material.

The Gas Traction Company, Minneapolis, Minn., will erect this summer a factory, blacksmith shop and warehouse.

The Standard Implement Mfg. Company, 512 Masonic Temple, St. Paul, Minn., recently incorporated for $150,000, will erect a factory, details of which have not been worked out.

The Southwest

KANSAS CITY, MO., May 9, 1910.

Traveling representatives of Eastern supply houses, who make Kansas City their headquarters, are unanimous in stating that the local plants visited in all parts of the Southwest are having an exceptionally profitable season, being filled with work at good prices. In the opinion of one salesman, whose opportunities for observation are more comprehensive than ordinary, the additions and extensions made thus far this year will be found quite inadequate to meet the demands of future business. The point has also been brought out in recent interviews that metal workers of the Southwest are coming to have a better appreciation than ever before of the actual profit of using modern high speed tools rather than those of older types with which many shops have been "getting along" for some years. This is shown to them very graphically in the comparative operating records of new shop units, recently installed, working side by side with those of early construction in the same plant. The inevitable result must be the displacement of the latter as soon as the owner feels that he can afford it.

The Independence Mfg. & Power Company, Independence, Kan., will install an electric generating unit of 300 kw., with exciter dynamo, switchboard and other apparatus.

The municipal power plant at Lincoln, Kan., which has a present capacity of 100 hp., will be enlarged by the addition of two 125 hp. boilers, engines of 125 and 75 hp., and an electric generator of 75 kw. Bids will be taken by the city until May 16.

V. W. Shaler, Oklahoma City, Okla., has installed a machine shop for repair work in connection with the new Standard auto garage recently completed there.

The Desert Power & Water Company, Kingman, Ariz., which has a power plant of 1000 hp. for local service and the sale of current to nearby mines, will install additional equipment. The president of the company, H. H. Tracy, and vice-president and manager, H. M. Tracy, are connected with the Tracy Engineering Company of Los Angeles, Cal.

The H. N. Strait Mfg. Company, Kansas City, has been awarded contract by the city of Medford, Okla., for two Monarch Corliss engines of 225 hp., combined, the smaller of which will be direct connected to a new 50 kw. dynamo. Bids for an alternating current dynamo of 100 kw., also two return tubular boilers, feed pumps, heater, &c., were rejected and contracts will not be closed until May 26.

The report recently given currency relating to a municipal power plant at Troy, Kan., was based on a misunderstanding. Only a sub-station will be needed, as a contract has been made to purchase current from the Atchison Railway, Light & Power Company and bring it in over a transmission line from Atchison, Kan.

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The Central West

OMAHA, NEB., May 9, 1910.

Shops all through this part of the West are beginning to take in considerable repair work, roll corrugating, grinding, &c., for the account of flouring mills and grain elevators, the proprietors of which have commenced preparations for handling the new crops, and dealers are receiving orders for a great deal of equipment.

The principal items include boilers, feed pumps and heaters, condensers, steam, gas and gasoline engines, gas producers, electric power and lighting sets, motors, starters, shafting, belting, pulleys, gears, clutches, exhaust fans, sprinklers and other protective apparatus, fire pumps, hose, screens, grain heaters, feed governors, mechanical packers, elevators, conveyors, scales, loaders and standard milling machinery; the last named, however, being supplied almost entirely by large manufacturers who make a specialty of it. This will continue a prolific source of demand during May, June and July, after which orders are likely to be only moderate for the remainder of the year.

As a filler for the hot weather season, the importance of the trade mentioned is coming to be more fully appreciated by machine shop operators in the West than it was in former years, and there is an appreciable effort to secure the custom of nearby plants.

Plain or corrugated iron sheathing, roofing, &c., sell well at present, and despite the inroads of reinforced concrete construction, steel storage tanks are still wanted in a good many places, affording some of the shops of this section opportunity for a very profitable line of work.

Trade in general continues fairly satisfactory, being principally, however, in the hands of jobbers and agencies except for heavy machinery or complete installations such as those made for electric power plants. Little if any change is looked for during the next few weeks.

The city of Provo, Utah, which is the headquarters of the Telluride Power Company's 35,000-kw. hydroelectric development, proposes to build its own power plant and also install pumping machinery for a water works system. The matter will be definitely decided in the near future.

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The Klauer Mfg. Company, Dubuque, Iowa, which operates a large plant for the production of metal culverts, said to be the most important in this line of any in the country, is putting on the market a complete outfit for this work, including corrugated curving rolls and a pneumatic punch and riveter of the company's own design.

The McConnell Boiler Works, Des Moines, is doing a good deal of work this season for the account of municipalities in this and adjoining States.

The city of Newton, Iowa, is preparing to install a new electric power plant about July 1, which will be larger and

The Machinery Markets

to La Porte, Texas, 23 miles distant, will erect at the latter place a large electric power house. The details of machinery equipment have not yet been worked out.

G. W. Mattison, Carthage, Mo., who handles for the Southwestern territory the internally fired boilers built by the S. Freeman & Sons Mfg. Company, Racine, Wis., has found this season's business very active.

An electric power set for lighting and other service will probably be installed this summer by the Lancaster Milling Company, Lancaster, Texas.

The Tofte Boiler & Sheet Iron Works, Houston, Texas, has been called upon this season for a great deal of tank work, for which there seems to be more than ordinary need in connection with various industries throughout the Southwest.

The Granby Mining & Smelting Company, Oronogo, Mo., has installed two pumping plants on new ground, which it will proceed to develop, necessitating the purchase of some additional equipment later on.

E. J. Gully, Prescott, Ark., has placed a new boiler in his saw mill near that city.

The installation of a municipal electric plant is proposed at Tipton, Mo., but no definite action to that end has as yet been taken.

The Brunner Water & Light Company, Brunner, Texas, is about to erect a new electric power and pumping plant.

Machinery for a new timber cutting mill, including boiler, engine and power transmission apparatus, is being installed near Glenwood, Ark., by A. V. Alexander of that place.

The St. Louis Southwestern Railroad is taking active measures toward the building of boiler, forge, wood working and machine shops, as well as an electric power plant, at Argenta, Ark. The site, however, will have to be secured by condemnation proceedings.

It is reported from Benton, Ark., that the Benton Light, Power & Ice Company, which now operates a Warren alternating current generator of 60 kw., engine driven, will build a new power plant of enlarged capacity.

A gas engine unit of 300 hp. was recently placed in continuous service at the Cementville plant of the San Antonio Portland Cement Company, San Antonio, Texas, and another of the same size will be added.

The Little Rock Handle Company, Little Rock, Ark., is making improvements in its plant, which include the installation of a new boiler and engine. Additional buildings are also to be erected.

The Dallas Terminal Railway & Union Depot Company, Dallas, Texas, will build extensive yard facilities and a roundhouse in South Dallas.

The Northwest

ST. PAUL, MINN., May 9, 1910.

The market for machinery continues fairly active, with sales mostly in small lots and scattered over a wide expanse of territory. Buying has gravitated more towards the North and comes more largely than usual from isolated districts where new industrial operations or developments of various kinds are in progress.

Among standard lines of equipment the most pronounced activity exists with respect to steam boilers, including an uncommonly large number of replacements due to wear and the use of higher pressures than were formerly considered safe. As a rule, each sale involves so much other apparatus that it runs up into considerable money, and there is very lively competition for the business among both manufacturers and dealers. The bulk of it appears to have been going lately to local shops.

Purchasing for the account of private corporations operating power lighting and heating plants, as well as municipalities, will also be quite general along all lines from now until about August 15, or later, as the need is felt of greatly increased facilities for the winter of 1910-11. During the past season many public service stations proved inadequate to the demands made upon them. The fiscal year of some companies ends June 30, and most of these are putting off buying until after that time, as it will still give them ample opportunity to make installations before cold weather again sets in, and maintenance charges last winter were so excessive as to compel rigid economy for as long a period as possible in order to pay the customary dividends. This is a factor which machinery manufacturers and dealers in supplies of various sorts should take into consideration.

Collections at present are reasonably prompt, but money is tightening as the result of preparations now being made to take care of the remainder of the old crop and provide for the movement of the new. This mainly concerns the market for agricultural machinery and implements, but other lines are affected and will be in increasing proportion from this time forward.

The city of Anoka, Minn., which now operates an old fashioned electric plant purchased some years ago from a private corporation, will build a new power house and substations equipped with modern machinery. A steam turbine unit is likely to be included.

The American Hoist & Derrick Company, St. Paul, whose increase in manufacturing facilities was recently referred to, is putting out a combination machine which can be used as track layer, tie or log loader, steam shovel, ditching and ballasting machine or pile driver.

The construction of a water supply system, with steam or gasoline engine driven pumps, is under consideration at Brandt, S. D.

A municipal public service plant, including pumping station, will be erected this summer at Raymond, Minn., a bond issue for the purpose having recently been voted.

The Northwestern Copper & Brass Works, St. Paul, Minn., is placing its new Victor heater in mills all over the country and some increase of manufacturing facilities will probably be necessitated before the end of the present year.

There is an opportunity at Chamberlain, S. D., for the purchase and improvement of an electric plant now held by the Chamberlain Investment Company. The present outfit consists of a Pelton turbine wheel of 150 hp. driving a Westinghouse alternating current generator, and other apparatus.

It is reported, without confirmation, that the Universal Tractor Company, Crookston, Minn., whose plans for rebuilding were recently mentioned, will become merged with the Northwestern Thresher Company, Stillwater, Minn.

Machine tools for a repair department may be required by the Duluth Automobile Company, Duluth, Minn., in connection with a new garage to be built this summer.

A new water tube boiler, pumping engine and elevated steel reservoir will probably be purchased this year at Chisholm, Minn., in accordance with the recommendation of the city's engineer, who has prepared plans for the extension of the water works system.

The Watertown Steel Tank Company, recently organized, is providing for a modern manufacturing plant at Watertown, S. D.

A new industry just established at Wahpeton, N. D., is that of the Northwestern Sheet Metal & Iron Company, whose products, in addition to what its name implies, will include steel culverts.

A new substation is to be erected in Minneapolis shortly by the Minneapolis General Electric Company.

The Great Northern Railway is about to begin erection of a new shop in connection with its repair works at St. Paul. The building permit provides for a structure to cost $40,000, its dimensions being given as 200 x 200 ft.

The South Park Foundry Company, St. Paul, has taken a fabricating contract of considerable size for the city of Chisholm, Minn.

Pumping machinery may be required in the near future at Mandan, N. D., as construction of a better water supply system has been actively taken in hand by the municipal authorities and results may be expected soon.

A large gyratory rock breaker has been purchased by the city of Two Harbors, Minn., for a municipal crushing plant. This will lead to other requirements along the same line.

The contract for electrical equipment of substations, in connection with the hydraulic power system of the Minidoka, Ida., project of the United States Reclamation Service, has been awarded the General Electric Company, Schenectady, N. Y.

The Nabob Mining Company, Wardner, Idaho, will put in service an air compressor operated by gasoline engine, preparatory to further development work which will necessitate the purchase of considerable additional machinery later on.

The Fisher Creek Mining & Smelting Company, Cabinet, Mont., which has a 10-stamp mill, is preparing to resume operations that were suspended some years ago and will probably require some further equipment in the near future.

The Northern Pacific Railroad Company is preparing to increase its division maintenance and repair facilities at Wallace, Idaho, including the erection of a new roundhouse.

O. W. Anderson, whose offices are in the Masonic Temple, Minneapolis, has organized the Standard Implement Company, which will manufacture certain patented specialties in the line of agricultural machinery. A factory is to be built this coming summer either at Minneapolis or in one of the other industrial communities of southern Minnesota.

Reports recently published, to the effect that the Pence Automobile Company would erect a manufacturing plant in Minneapolis on a tract 150 x 230 ft., which has been acquired, are not correct. This may be done later on, but at present the site will be utilized for a warehouse.

The American Ornamental Iron & Bronze Company,

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Minneapolis, is having extensive alterations made in the foundry and shop buildings recently secured for its business, and modern equipment will be installed.

Sealed bids will be received by the Mayor and Town Board of Allerton, Iowa, until May 17, for furnishing and installing the following material for the construction of an electric light plant: One 80 b.h.p. producer gas engine for belt driving alternating current generator; one producer gas outfit complete of sufficient size to drive above engine; one 50 kw. generator belt driven, switchboard, arc regulators, arc and tungsten lamps, poles and line material.

The Gas Traction Company, Minneapolis, Minn., will erect this summer a factory, blacksmith shop and warehouse.

The Standard Implement Mfg. Company, 512 Masonic Temple, St. Paul, Minn., recently incorporated for $150,000, will erect a factory, details of which have not been worked out.

The Southwest

KANSAS CITY, MO., May 9, 1910.

Traveling representatives of Eastern supply houses, who make Kansas City their headquarters, are unanimous in stating that the local plants visited in all parts of the Southwest are having an exceptionally profitable season, being filled with work at good prices. In the opinion of one salesman, whose opportunities for observation are more comprehensive than ordinary, the additions and extensions made thus far this year will be found quite inadequate to meet the demands of future business. The point has also been brought out in recent interviews that metal workers of the Southwest are coming to have a better appreciation than ever before of the actual profit of using modern high speed tools rather than those of older types with which many shops have been "getting along" for some years. This is shown to them very graphically in the comparative operating records of new shop units, recently installed, working side by side with those of early construction in the same plant. The inevitable result must be the displacement of the latter as soon as the owner feels that he can afford it.

The Independence Mfg. & Power Company, Independence, Kan., will install an electric generating unit of 300 kw., with exciter dynamo, switchboard and other apparatus.

The municipal power plant at Lincoln, Kan., which has a present capacity of 100 hp., will be enlarged by the addition of two 125 hp. boilers, engines of 125 and 75 hp., and an electric generator of 75 kw. Bids will be taken by the city until May 16.

V. W. Shaler, Oklahoma City, Okla., has installed a machine shop for repair work in connection with the new Standard auto garage recently completed there.

The Desert Power & Water Company, Kingman, Ariz., which has a power plant of 1000 hp. for local service and the sale of current to nearby mines, will install additional equipment. The president of the company, H. H. Tracy, and vice-president and manager, H. M. Tracy, are connected with the Tracy Engineering Company of Los Angeles, Cal.

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The city of Newton, Iowa, is preparing to install a new electric power plant about July 1, which will be larger and

The Machinery Markets

more modern in every respect than that now operated. The present generating units, consisting of two Detroit dynamos of 70-kw. each, driven by belting from an 18 x 36 in. Sioux City engine, will be disposed of to the highest bidder.

The Caldwell-Hallowell Company, recently organized at Waterloo, Iowa, is building a factory on a site adjacent to the works of the Waterloo Gasoline Engine Company.

A. L. Peterson, Cresco, Iowa, will build a new factory 50 x 90 ft., for the production of electrical apparatus.

One or more electric motors will be added shortly to the equipment of the Daisy Combination Mining Company, Mercer, Utah.

Some additional pumping machinery will be needed this year for municipal service at Grand Island, Neb.

Additions will be made shortly to the concentrating machinery of the Arcade Mining & Milling Company, Ward, Colo.

Development work necessitating the purchase of some new equipment will be undertaken this summer on the property of the Coney Gold & Silver Mining Company, Alma, Colo.

The King Foundry Company, Nebraska City, Neb., whose output consists of iron, brass, bronze, aluminum and semisteel castings, is making a specialty of mixtures for gas engine cylinders. The demand at present is very active.

A large electric power plant will be built near Douglas, Wyo., by the North Platte Irrigation Company. Machinery for the initial unit has just been ordered from the Wagner Electric Company, St. Louis, Mo., but more will be required later.

The Chicago Great Western Railway Company has added to its car building and repair shops at Oelwein, Iowa, the plant of the Oelwein Foundry Company. The latter, or interests identified with it, will probably rebuild in a new location.

The Marshalltown Power & Light Company, Marshalltown, Iowa, whose plans for enlarged capacity were mentioned some time ago, will provide for about 750 kw. additional. Two boilers of 350 hp. each, with automatic stokers, will be installed in the near future.

Construction of a municipal power and lighting plant is under consideration by the authorities at Oakland, Iowa.

The Slack-Horner Brass Mfg. Company has purchased the plant and business of the Ben F. Slack Mfg. Company, Denver, Colo. The capital stock of the new company is $20,000. John W. Horner is president and B. F. Slack secretary. The present machinery requirements have been filled.

The South

NASHVILLE, TENN., May 9, 1910.

Trade in most lines is light and rather variable; but dealers who carry good sized stocks report a fair aggregate of business. In quite a percentage of cases the apparatus now being ordered is required to complete or extend installations started a month or two ago, and prompt shipment is an object to the buyer. Apparatus for the transmission and application of mechanical or electrical power, including small motors, has been prominent in recent sales, with every prospect of a steady run of business from the mills and factories for equipment of this class.

Through the cut stone districts considerable buying has developed lately for machinery, tools and material used in or about quarries. A quiet but forceful campaign is being conducted for the more extensive use of Southern stone in large building operations, monumental work, &c., and within the past 12 to 15 months a good deal of outside capital has taken hold in the development of this industry. From the standpoint of mechanical equipment it is now a great deal in advance of what it was a few years ago. Present requirements range from the dewatering pumps, compressors, drills, hoists, chains, tackle, derricks and other apparatus applied directly in the quarries, to the cranes, steel gang and rip saws, conveyors, planers, surfacers, lathes, channelers and pneumatic tools used in the finishing plants. The production of paving blocks, as a related line, takes similar but less extensive outfits. To an increasing extent, also, electric power machinery is needed, as operation by means of motors has become general in the newer plants and workings.

J. B. McCrary, of the well known Atlanta, Ga., engineering firm, is reported to have organized the Yellow River Power Company, to build a hydroelectric plant of 12,000 kw. on the Yellow River near Stone Mountain, Ga. The details of the plan are still, however, to be worked out, and machinery specifications do not appear to have been as yet prepared.

Among industrial companies operating in the South who have commenced to make use of producer gas power on a large scale is the Southern Cotton Oil Company of New York City, which has let contracts up to this time for units aggregating 1500 hp. to be installed at Montgomery, Ala., Greenwood, S. C., and Bennettsville, Ga., the first named plant being already in operation.

The Columbus Iron Work Company, Columbus, Ga., has made a good many sales lately of power and refrigerating machinery, which are being operated in combination to a rapidly increasing extent all through the South.

Construction of an electric power and pumping station is under consideration by the municipal authorities at Fairburn, Ga.

A filtration plant for municipal water service will probably be provided in the near future at Talladega, Ala.

Peacock's Iron Works, the growth in whose business was recently noted, will probably be offered substantial inducements to remove to Gadsden, Ala., where the matter has been brought up by the Business Men's Club.

The project for a municipal pumping plant and water works system will probably be carried through during the coming summer at Williamston, S. C.

The new municipal electric plant for Beaufort, S. C., is to be completed about October 15, and equipment will be required at some time during the summer.

Robert Hooke, Chattanooga, Tenn., is putting on the market a very complete portable outfit for asphalt paving work, which provides for the handling of the various materials by one machine.

Considerable machinery and other equipment will be required for carrying out the new system of water works to be installed by the city of Chattanooga, Tenn. Plans and specifications are now being prepared by an engineer whom the municipality recently engaged for that purpose.

The Converse Bridge Company, Chattanooga, Tenn., has recently taken quite a number of contracts for steel bridges to be built in this and adjacent States.

The Jennings Electric Light & Power Company, Jennings, La., which is operating three direct current generators of 225 kw. aggregate capacity, will install an alternating current dynamo, engine driven.

The Florida Mining Company, Mulberry, Fla., will install two additional centrifugal pumps driven by electric motors.

An engineer has been engaged by the city of College Park, Ga., to prepare plans and specifications for a pumping plant.

The Columbian Iron Works, Chattanooga, Tenn., whose activity was recently noted, may add to its present plant or build a new one. Definite plans have not yet been made.

The Birmingham Horseshoe & Rolling Mills Company, whose general offices are in suite 648, Brown-Marx Building, Birmingham, Ala., is making rapid progress on the horseshoe plant now under construction near that city. The buildings are substantial, being mainly of steel and brick. It is expected that the buildings will be finished by September 1. It is understood that contracts for machinery have not yet been awarded. It is the expectation that the plant will make about 400 kegs of horseshoes a day. A rolling mill adjoining the horseshoe plant is to have a capacity of about 50 tons a day. No contracts have yet been let for the buildings or machinery of the rolling mill.

The American Automatic Railway Switch Company, Brown-Marx Building, Birmingham, Ala., has completed plans for the erection of a plant to manufacture a patented automatic switch. G. A. Neal is president and E. L. Penruddocke is engineer in charge of the work.

The Lexington Supply Company, Lexington, S. C., is in the market for machine shop equipment, dynamos, electrical supplies, vulcanizers, general auto supplies and mill equipment.

The Alabama, Tennessee & Northern Railroad Company, John T. Cochrane, president, Mobile, Ala., has located its shops at Panola, Ala. The engine and car shops combined are 40 x 75 ft., and the machine shop is 30 x 40 ft. There will also be a carpenter shop, 30 x 40 ft. Part of the equipment has been installed, but the company expects to add wheel and axle machines, an air compressor plant and also more machine tools some time in the near future.

The Anderson Machine & Foundry Company, Anderson, S. C., has increased its capital stock to $20,000, and will add a 40 x 140 ft. building to its plant.

The Hale Buggy Company, D. P. Hale, president, Anniston, Ala., has purchased a factory in that city, to which will be added two additional buildings. The plant will be used for the manufacture of buggies. Considerable new equipment will probably be required.

The Construction Quartermaster at Fort Dade, Fla., post office, Egmont, will open bids May 20 for the construction of an electric lighting system, consisting of inside and outside wiring, transformers, engines and generators.

The Doe River Lighting & Power Company, Elizabethton, Tenn., has awarded a contract to the Lowe Construction Company, Bristol, Tenn., for the construction of a dam 50 ft. high and 300 ft. long, in connection with the construction

The Machinery Markets

of a hydroelectric plant to develop 3000 hp. The power is to be sold to the Bristol Gas & Electric Company of Bristol. The electrical machinery to be installed will include two 1000-kw. generators, three-phase, 60-cycle, 2300 volts; six transformers, a 150-kw. generator, one 200-hp. vertical water wheel, three units of turbines to operate under 50-ft. head and develop 1200 hp. each, two governors and other equipment. The Lowe Construction Company will buy all the machinery.

San Francisco

SAN FRANCISCO, CAL., May 4, 1910.

The oil industry now takes the lead over all other lines of activity on the Pacific Coast, and the heaviest requirements of machinery are likely to be in the oil fields for some time to come. Not only is there a strong and increasing demand for drilling equipment, but the inquiry of late has turned more strongly toward pumps, &c., to be used in connection with the pipe lines and storage tanks which are being installed to handle the output. The rush of work in the machine, tank and pipe manufacturing shops in the oil fields has necessitated some increase of equipment, and the market for machine tools is accordingly much more active in that district than in other parts of the Coast.

There is practically no demand for machine tools in San Francisco; most of the local shops are running at one-half to one-third their normal capacity. This condition is attributed partly to the unsettled political situation, which appears to prevent investment of capital in local enterprises, and partly to labor conditions, which are extremely unfavorable. A movement is on foot to return to the nine-hour working day this summer, but the outcome is very uncertain. Under the present schedule it is almost impossible for local machine shops to compete with those of other Coast cities, where conditions are more favorable to the employer.

Some improvement is noted in the demand for metal working tools in the interior of California. The Holt Mfg. Company, Stockton, Cal., has placed some large orders recently, and there is a fair inquiry from Sacramento. While most sales at the moment are of small tools, some large business is in prospect, including equipment for several projected railroad shops and for the navy yard at Mare Island.

The Pelton Water Wheel Company's San Francisco plant is the only local shop running full time. Its new boring mills, drills, &c., are now complete, and with two shifts working overtime the equipment is in as nearly continuous operation as possible. In addition to several large water wheel contracts for hydroelectric plants, this company has taken a considerable volume of business involving smaller water wheels up to 500 hp. capacity. Some recent contracts are as follows: Pato Mining Company of Venezuela, two Pelton-Francis turbine units of 1200 hp. capacity at 450 rev. per min., under an 81-ft. head; La Grange Mining Company of California, a Pelton-Francis turbine, 850 hp., 450 rev. per min., 220 ft. head; Inland Portland Cement Company, Spokane, Wash., two Pelton impulse units, 360 rev. per min., 450 ft. head, to generate 6000 hp; Tuolumne Electric Company of California, a Pelton-Francis turbine, 1200 hp., 600 rev. per min., 428 ft. head; Kauai Electric Company, Hawaiian Islands, a 2500-hp. Pelton impulse unit, 375 rev. per min., 575 ft. head; Washington Water Power Company, Spokane, Wash., two cylindrical case Pelton-Francis turbines, each developing 1300 hp. at 300 rev. per min., 65 ft. head, direct connected to alternating current generators; Laramie-Poudrie Reclamation & Irrigating Company, Colorado, three Pelton impulse units driving electric generator, air compressor and blower, to be used in driving a 9000-ft. tunnel; Whatcom County Railway & Light Company, Bellingham, Wash., a multiple Pelton impulse wheel unit, 3200 hp., 200 rev. per min., 165 ft. head.

The demand for general woodworking machinery is again increasing, and while the principal inquiries are for single machines, figures are being taken on several sawmills, box factories, &c., both in California and the northern Coast States.

The California Barrel Company is installing a number of new machines in its Los Angeles shop.

The S. Beer Gold Mill & Extraction Company has been incorporated at Sacramento, Cal., with a capital stock of $100,000. S. Beer is president and C. Tilton, secretary. The company intends to manufacture quartz mills.

The city of Los Angeles, Cal., has ordered an electric locomotive from the Westinghouse Electric & Mfg. Company.

The Nevada-California Gold Mining Company is planning a new mill near Coulterville, Cal.

The San Diego, Cal., city blacksmith shop is being equipped with electric power.

The Barstow Utility Company has been incorporated at San Bernardino, Cal., with a capital stock of $50,000, by W. W. Brison, Jr., W. M. Parker and C. L. Allison. The company will manufacture ice making and refrigerating machinery.

The Woodman Mining Company, Salt Lake, Utah, has decided to install a 50-ton ore mill.

It is reported that the Southern Pacific Railroad will erect a roundhouse and small machine shop at Colfax, Cal.

The Hammond Lumber Company has ordered two new steamers, one to be of steel, 3000 tons, with triple expansion engines, to be built by Kirk's shipbuilding plant, Long Beach, Cal. The other will be a wooden vessel of 1500 tons, to be built at Eureka, Cal.

Staples & Clinch are preparing to install a machine shop at Chino, Cal.

Architect Mohr of the Western Pacific Railroad, is preparing tentative plans for large machine shops at Sacramento, Cal., but working drawings for the project have not been started.

The Porterville Mfg. Company is being organized at Porterville, Cal., for the purpose of conducting a foundry and machine shop.

H. L. Thornton, manager of the Pacific Consolidated Stone Company, Los Angeles, Cal., has gone East for the purpose of ordering machinery for a stone finishing plant.

The city of Alameda, Cal., will soon be in the market for a boiler for the municipal electric light plant.

Contracts for a rock crushing plant for the Santa Fe Railroad on Kings River have been let to the Sharp-Hauser Company, Fresno, Cal. The crusher will have a daily capacity of 2000 cu. yd. of rock.

The Phillips Contracting Company, San Bernardino, Cal., is preparing to install a large rock crusher near Corona, Cal.

There has been a general demand for canning machinery in the interior of California this spring, and new orders are still coming in, as a number of new canneries are being established. Orders of this nature are usually rather small, but the total this season has been larger than for several years. Los Angeles interests are now promoting a project to establish a can factory at Stockton, Cal.

Government Purchases

WASHINGTON, D. C., May 9, 1910.

Capt. M. E. Saville, Constructing Quartermaster, Twenty-seventh Infantry, Fort Sheridan, Ill., will open bids May 23 for 10 steam heating boilers.

Capt. P. Whitworth, Quartermaster, U. S. Army, Fort Crockett, Galveston, Texas, will receive bids until May 31 for the construction of an electric lighting system at that post.

P. W. Guiney, Constructing Quartermaster, U. S. Army, Fort Sam Houston, Texas, will receive bids until June 4 for the construction of a pumping, ice and ice storage plant and of a post laundry.

Capt. E. C. Long, Constructing Quartermaster, U. S. Army, Arcade Annex, Seattle, Wash., will open bids May 28 for the construction of a water system. The list of requirements include an engine, pumps, reinforced concrete reservoirs, &c.

The Bureau of Supplies and Accounts, Navy Department, Washington, will open bids May 24, under schedule 2450, for the following: Two air compressors, with motors, and a miscellaneous lot of generators, transformers, &c. Schedule 2449, one 5000-lb. steam drop hammer; 2459, one electrically driven pump; 2477, eight rivet heating furnaces.

James Knox Taylor, Supervising Architect, Treasury Department, Washington, will receive bids until June 15 for the installation of a heating plant, pumps, vacuum cleaning plant, electric wiring, &c., for the U. S. Custom House at San Francisco, Cal. Specifications can also be seen in the office of Eames & Young, Wright Building, St. Louis, Mo.

Lieut. Charles C. Winnia, Constructing Quartermaster, U. S. Army, Fort Bayard, N. M., will open bids May 28 for furnishing and installing a power refrigerating and electric light system at that post.

The Bureau of Supplies and Accounts, Navy Department, Washington, opened bids May 3 for the following:

Class 182.—Twenty-four vertical simplex feed pumps.—Bidder 11, the Blake & Knowles Steam Pump Works, New York, $118.50; 31, Drew Machinery Company, Manchester, N. H., $95.50; 33, M. T. Davidson Company, Brooklyn, N. Y., $77.50; 81, Manning, Maxwell & Moore, New York, $103.50; 127, Union Steam Pump Company, Battle Creek, Mich., $104.67; 133, Vermilye & Power, New York, $87.50; 140, Warren Steam Pump Company, New York, $150; 141, C. H. Wheeler Mfg. Company, Philadelphia, Pa., $94.

The Chief of Bureau of Yards and Docks, Navy Department, Washington, received the following bids on April 30 for condenser, piping and pumps for the Central power plant, Boston Navy Yard: Item 1, work complete; 2, same as item 1, but with steam driven circulating pump.

John W. Danforth Company, Buffalo, N. Y., item 1, $13,774; Walworth Mfg. Company, Boston, Mass., item 1, $16,744, Alberger condenser equipment; $17,497, Wheeler condensing equipment.

D'Olier Engineering Company, Philadelphia, Pa., item 1, $16,425.

The Pennsylvania Steel Company

New Coke Ovens, Finishing Mills and Steel Capacity

The report of the Pennsylvania Steel Company, covering the fiscal year ending December 31, 1909, so far as it relates to subsidiary companies, and the fiscal year ending April 30 for the company itself, was issued to the stockholders last week. It contains an interesting statement of the improvements made at various plants in the past year and outlines the improvements which are to be made from the proceeds of the recent issue of $4,087,500 of preferred stock. These latter include new open hearth furnaces and additional converter capacity at Steelton, new finishing mills at Sparrows Point, blast furnace improvements and the building of more by-product coke ovens at both plants. We make extracts from the report below:

Iron Ore and Coal Properties

The coal properties in Indiana County, Pa., owned by the Penn-Mary Coal Company produced 890,000 tons of coal in 1909, compared with 590,000 tons in 1908. During the year 33 new miners' houses were built, besides a superintendent's residence and four better class houses for foremen and clerks. The development of the old mines has been well kept up and a new mine, which will open a large territory below the drainage level of the older mines, was put in operation during December. The expense of opening and equipping this new mine has been charged to mining costs.

The old properties owned in Cuba by the Spanish-American Iron Company produced during 1909 514,000 tons of iron ore, compared with 452,000 tons in 1908. The usual exploration work for the development of new ore bodies was continued, with the result that the estimated reserves at the end of the year were in excess of those at the beginning, notwithstanding the 500,000 tons of ore which were taken out of the mines. Extensive improvements and betterments were made, consisting of three new steam shovels, new locomotives and cars, new steel ore storage bins, additional houses, &c.

The work of developing the Spanish-American Iron Company's new iron ore property at Mayari, on the north coast of Cuba, was prosecuted diligently and the mines were put in operation in a small way on November 24, 1909, since which time they have been regular producers with an increasing output in each succeeding month. A production of 15,000 tons per month has already been reached, and it is expected that this will be doubled by July 1, 1910.

Operations at Steelton and Sparrows Point

The Pennsylvania Steel Company, with works at Steelton and Lebanon, Pa., and Maryland Steel Company, with works at Sparrows Point, Md., produced 700,000 tons of pig iron in 1909, compared with 384,000 tons in 1908, and of steel ingots 797,000 tons in 1909, compared with 438,000 tons in 1908. The principal improvements and extensions made to the works and property of the Pennsylvania Steel Company were a considerable addition to the steel foundry department, machinery and equipment for transferring Bessemer steel to open hearth, gas blowing engines for blast furnaces, new equipment for machine shops, &c. Besides this, additions and improvements were made to the blast furnace department, consisting of additional boilers and steam line to connect with rolling mills, and improvements to Bessemer and open hearth departments.

In the year three and one-eighth shares in the Cornwall ore banks were acquired, bringing the Pennsylvania Steel Company's interest in this mining property to more than 54 per cent. of the whole.

The installation of plant and equipment to improve mining operations at the Cornwall ore banks was practically completed at the end of the year. These improvements have cost in excess of $500,000 and this entire amount has been taken out of mining profits as the work progressed.

At the Sparrows Point plant of the Maryland Steel Company the construction of five 50-ton open hearth furnaces was begun in June, 1909, and the first steel was produced from them in the latter part of February of the present year, only eight months having elapsed from the beginning of excavation work until the plant was making steel. The completion of these furnaces will enable the Maryland Steel Company to furnish rails of either Bessemer or open hearth quality. The open hearth plant is so arranged that it may be operated in connection with the Bessemer plant by the duplex process, or independently in the ordinary way.

During 1909 the Maryland Steel Company also began the construction of extensive iron ore docks equipped with appliances for the rapid discharge of ore from ships to cars or storage. These docks will be completed about the middle of 1910. It is expected that they will handle all iron ore coming by sea for the plants of both the Maryland and the Pennsylvania steel companies.

The marine department of the Maryland Steel Company completed three large colliers for the United States Government and several other smaller vessels. This department was not fully occupied during the first half of the year, but the close of the year found it well supplied with orders.

Production and Prices

A summary of the principal products of the various companies in gross tons is as follows:

	Tons.
Coal	890,000
Coke	698,000
Iron ore	1,000,000
Pig iron	700,000
Steel ingots	797,000

The fluctuation in the prices received during the year for the products of subsidiary companies was extreme. A severe beak in all prices except those of rails occurred in February. In July an upward movement began, which continued until the end of the year, when prices were at about the same point as at its beginning. It was only during the last third of the year that these higher prices were reflected in the increased earnings of your companies.

Financial Statement

The combined income account for all companies for the year is as follows:

Net earnings from operations	$3,762,504.04
Rents, income from investments and interest	192,520.05
Income from all sources	$3,955,024.09
Less interest on bonded debt	1,120,968.74
Net income	$2,834,055.35
Less charges for depreciation of plants and equipment	847,266.02
Net profits	$1,986,789.33

The balance sheet of the company and its profit and loss account at the close of business April 30 are as follows:

BALANCE SHEET.

Assets.

Cash	*$99,918.84
Loans to operating companies	2,049,003.50
Stocks and bonds	25,198,829.59
Accrued interest	13,573.66
Total	$27,361,325.59

Liabilities.

Preferred stock	$16,500,000.00
Common stock	10,750,000.00
Profit and loss	111,325.59
Total	$27,361,325.59

* After paying May 1 dividend.

PROFIT AND LOSS ACCOUNT, 12 MONTHS ENDING APRIL 30, 1910.

Dividends paid 7 per cent. preferred	$1,155,000.00
Expenses (and adjustment in value of securities)	34,446.96
Balance, April 30, 1910	111,325.59
Total	$1,300,772.55
Balance May 1, 1909	$483,952.55
Dividends from operating companies, interest on securities, loans and bank balances	816,820.00
Total	$1,300,772.55

Improvements Planned

Extensive improvements are in contemplation at the plants of all subsidiary companies. Additional miners' houses are required at the coal mines, and increased ore drying facilities are necessary at the new iron mines in Cuba to bring the output of iron ore up to the requirements of your steelmaking companies. It is also intended to increase the by-product coke plants at both Steelton and Sparrows Point, as well as to extend and improve the blast furnaces at both places by the increase in hot stove and blowing capacity and the addition of labor-saving devices. The erection of new rolling mills at Sparrows Point is contemplated, which will enable the Maryland Steel Company to diversify its lines of products. The facilities at the Steelton Works for carrying on the duplex process will also be simplified and improved.

To provide the funds required to make these additions to the plants of your subsidiary companies, the board at its April meeting voted to issue 40,875 shares of the preferred stock, and to offer the same pro rata at par to the holders of preferred and common stock, thus increasing the preferred stock from $16,500,000 to $20,587,500, and making the total of both preferred and common stock $31,337,500. Since the formation of the company at the beginning of 1901 upward of $17,000,000 has been put back by the various subsidiary companies into their plants and properties out of their earnings.

Personal

James W. Van Cleave, president of the Buck's Stove & Range Company, St. Louis, has been seriously ill with heart trouble, suffering a relapse after partial recovery.

Benjamin Talbot, Middlesbrough, Eng., has returned home after a visit of several weeks in the United States.

Edgar S. Cook, president of the Warwick Iron & Steel Company, Pottstown, Pa., has returned from a tour in the Orient.

J. D. Maxwell, who has been elected president of the Maxwell-Briscoe Motor Company, Tarrytown, N. Y., has been connected with the automobile industry for 16 years, during which he has developed numerous inventions. Prominent among the devices which are standard, being found on 90 per cent. of motor cars, are his unit power plant, multiple-disc clutch and thermosiphon system of cooling, with the radiator in front of the engine. Mr. Maxwell has been vice-president and general superintendent of the company and succeeds to the presidency following the resignation of Benjamin Briscoe, who has assumed the presidency of the United States Motor Company, 505 Fifth avenue, New York.

F. W. Dean, mill engineer and architect, Boston, Mass., is to read a paper discussing features of mill construction and power plants before the June meeting of the Scranton Engineering Society, Scranton, Pa.

Andrew Carnegie sailed from New York May 4 to spend the summer in Scotland, in accordance with his custom of recent years.

F. H. Moyer has resigned his position as chief engineer of the Indiana Steel Company, Gary, Ind., and will be located at 4101 Drexel boulevard, Chicago, until June 1.

John C. Williams has been appointed general superintendent of the Weir plant of the Phillips Sheet & Tin Plate Company at Weirton, W. Va. E. L. Cronemeyer, former assistant superintendent of the Clarksburg plant, has been made general superintendent.

W. S. Horner of Pittsburgh, director and special representative of the American Rolling Mill Company and the International Metal Products Company of Middletown, Ohio, will sail for Europe May 18, accompanied by R. B. Carnahan, Jr., general superintendent of the same companies. They will visit most of the countries of continental Europe and will be absent for several months.

Frank Salomon, chief engineer of Alfred H. Schutte, New York, sailed May 5 for Europe after spending three months in this country visiting American machinery manufacturers.

A. C. Pieper of Bruce & Cook, New York, has returned from a two months' Mediterranean cruise.

Director Wolfensberger and Dr. Langen, both of the Cologne headquarters of the Otto Gas Engine Company, left this country May 6 for Europe after a six months' visit among American manufacturers.

E. J. Mishler has been appointed sales manager of the tube works department of the Reading Iron Company, Reading, Pa., succeeding the late Arthur Safford, to whom he was assistant for a number of years. H. F. Mattern has been appointed as one of Mr. Mishler's assistants. Mr. Mattern was formerly connected with Cofrode & Saylor, and later with the American Iron & Steel Mfg. Company and the Lebanon Chain Works.

A. C. Dinkey, president of the Carnegie Steel Company, Pittsburgh, recently made a trip of inspection to the company's plants in the Youngstown district. It is announced that active work will begin this month on the new mills to roll bars and small shapes at Girard, Ohio.

H. L. Whittemore, associate professor in theoretical and applied mechanics, University of Illinois, Urbana, Ill., has received the appointment of engineer of tests in the Ordnance Department of the United States Government at Watertown Arsenal, Watertown, Mass. The appointment is in a way another evidence of the esteem with which the work of the laboratory of applied mechanics of the University of Illinois is held. Professor Whittemore will succeed James E. Howard, who has been engineer of tests at Watertown Arsenal for more than 30 years, and who has now accepted the position of engineer-physicist in the Bureau of Standards at Washington, D. C.

The General Electric Company has appointed R. T. Brook sales manager and G. O. Hodgson assistant, to take charge of the new office of the company, which has just been established in the Brown-Marx Building, Birmingham, Ala.

Earle M. Cary, for a long time vice-president and sales manager of the Alabama Consolidated Coal & Iron Company, has severed his connection with that concern, and will be succeeded by J. W. Porter, who was formerly in charge of B. Nicoll & Co.'s office in Birmingham, Ala.

Ohio Engineers' Meeting.—The twenty-first meeting of the Ohio Society of Mechanical, Electrical and Steam Engineers will be held May 19 and 20 in the Sinton Hotel, Cincinnati. The following papers will be presented: "Selecting a Boiler," by F. C. Bitgood, sales manager Cincinnati office, Babcock & Wilcox Company; "The Scientific Treatment of Boiler Feed Water," by Herbert E. Stone, sales manager Dearborn Drug & Chemical Works; "Refrigerating Machinery and Appliances," by H. D. Pownall, mechanical engineer Triumph Ice Machine Company, Cincinnati; "Metallurgical Considerations in the Manufacture of High Pressure Valves and Fittings," by George K. Elliott, chief chemist Lukenheimer Company, Cincinnati; "Centrifugal Pumps: Their Uses and Limitations," by L. G. Finlay, engineer-salesman, Cleveland; "The Kinney Positive Pressure Rotary Pump," by C. O. Thurston, Kinney Mfg. Company, Boston. Oscar F. Rabbe, Toledo, is president and Frank E. Sanborn, Ohio University, Columbus, is secretary and treasurer.

New Publications

Applied Mechanics. By David Allan Low. Bound in cloth. Size 6 x 9 in.; 550 pages; 850 illustrations. Price, $2.75 net. Published by Longmans, Green & Co., 443 Fourth avenue, New York City.

This is a textbook for engineering students taking a two years' course in the subject of applied mechanics, and embraces strength and elasticity of materials, theory and design of structures, theory of machine and hydraulics. This subject covers a very wide field, and the author has attempted as far as possible to compress into one moderate sized voume enough material for a course in the subject. With this object in view, the text has been made as clear and concise as possible, with the assumption that the student will devote considerable time to working out the exercises which are given to supplement the text. These exercises are scattered through the book in the different chapters to illustrate the application of the text. The greater part of these is original, although about one-quarter has been selected from examination papers of different examining bodies.

The first few chapters are preliminary and deal with such subjects as motion, force, work, energy, polygon of forces and simple strains and stresses. These are followed by chapters dealing with beams, columns and the design of structures, which in turn are succeeded by chapters dealing with engines and machines. Power transmission by belts, ropes, chains, toothed gearing and trains of wheels is next considered, and is followed by hydrostatics, the general principles of hydraulics, water wheels and turbines, and pumps.

The Engineering Index Annual, 1909. Size, 6 x 9 in.; pages, 471. Bound in cloth. Published by the *Engineering Magazine,* 140-142 Nassau street, New York. Price, $2.

This volume, which is the fourth since the work assumed the annual form, gives the names of technical articles, with a brief description of their scope, that have appeared in the various engineering periodicals of the world in 1909. The subjects covered are civil engineering, electrical engineering, marine and naval engineering, mechanical engineering, mining and metallurgy, railroad engineering, street and electric railroads and industrial economy. The chief purpose of the plan of indexing followed in this volume is to collate for each specialist the entire current literature of his subject and to assemble it in a small compass where it may be readily found and completely explored. The statement is made that the demand for last year's Annual in the first month following its publication took more copies than were sold of the previous Annual in the whole year after its publication, and almost as many as have been sold of the 1907 Annual in the two years since it appeared. This is conclusive evidence of the proved serviceableness of the work to its users.

Kelly's Directory of Merchants, Manufacturers and Shippers of the World. Pages, 2816 + cclxxx; 9 x 10 in.; cloth bound. Published by the Kelly Publishing Company, New York, and Kelly's Directories, Ltd., London. Price, $15.

This huge directory in its familiar red cloth binding has now been published since 1878. It covers every country engaged in international commerce and contains classified lists of consuls, banks, manufacturers, importers, exporters, merchants, brokers, shipping agents and jobbers. With the data for each country is given a brief statistical account of its financial position, its ports and principal towns, with a short topographical account and the population of each. The indexing is elaborate, being made according to countries and towns and also according to trades, making it possible to ascertain the lines of trade of any city or to take out all the names given in the book of any trade. The volume is remarkable for the completeness and variety of its information, and will be, as it has long been, of exceptional value to all engaged in export trade in any line. It is a marvel how such detailed information has been brought together concerning the trade in many cases of out-of-the-way countries of the world.

The Earning Power of Railroads. 1910. By Floyd W. Mundy. Size, 5 x 7 in.; pages, 462. Bound in cloth. Published by Jas. H. Oliphant & Co., 20 Broad street, New York.

This is a new edition of a work which has become a manual for ready reference with regard to the earning power of a large number of the railroads of the United States. While it does not cover all the railroads, it apparently includes those which are most likely to be the subject of investigation by investors. The introductory comments are both interesting and instructive.

Labor Notes

A number of foundries at Racine, Wis., are closed down by a strike of molders and coremakers, which took place May 6. A flat minimum of $3 a day is asked for floor and bench molders and coremakers, with a reduction in hours from 10 to 9. Heretofore each of these employments has had its own minimum, as low as $2.35 having been paid for coremakers, $2.65 for bench molders and $2.85 for floor molders. Some shops have paid a minimum of $2.50 for coremakers, $2.85 for bench molders and $3 for floor molders. The Standard Foundry Company and the Racine Foundry Company granted the advances asked. Among the other foundries in which the advance was asked are those of S. Freeman & Sons Mfg. Company, American Seating Company, J. I. Case Threshing Machine Company, J. I. Case Plow Works, Belle City Mfg. Company, American Skein & Foundry Company, Lakeside Malleable Iron Company, Pierce Motor Company, Reliance Iron & Engine Company, Racine Aluminum & Brass Foundry Company and Racine Iron & Brass Company. Some of these plants, which are open shops, are still at work, while others are shut down. The position taken by the members of the National Founders' Association is one of opposition to a flat rate for the three kinds of labor.

The Pennsylvania Engineering Works, New Castle, Pa., builder of blast furnaces and rolling mill and steel works equipment, has given its employees a voluntary advance in wages of 5 per cent., effective May 1.

The Youngstown Sheet & Tube Company, Youngstown, Ohio, has made an advance in common labor of 6 per cent., but the advance to higher classes of labor will be less. There will be no advance to tonnage men except in the sheet mills, where they will receive the same advance as that recently made by the American Sheet & Tin Plate Company. All these advances are practically the same as those made by the subsidiary interests of the United States Steel Corporation.

The union molders and coremakers employed in Newark, N. J., foundries made a demand this week for an advance of 50 cents a day for coremakers and bench molders and 25 cents a day for floor molders to a uniform day rate of $3.50, to become effective June 1.

The strike of union molders and coremakers of E. W. Bliss & Co., Brooklyn, N. Y., is still on. In a number of other foundries in New York and vicinity the differences between the employers and union workmen have been adjusted on the following basis: Molders to receive an advance from $3.25 to $3.50 a day, coremakers to be advanced now from $3 to $3.25 a day, and on January 1, 1911, to receive a further advance of 25 cents a day, putting them on a parity with molders.

Cast Iron Committee of the Testing Society

The secretary, Dr. Richard Moldenke, has sent to members of Committee B, on Cast Iron, of the American Society for Testing Materials, minutes of the recent meeting of the committee at Philadelphia. The chairman, Walter Wood, referred to the work of the testing congresses at Budapest and Brussels, which resulted in the appointment of an International committee, called Subcommittee Ia, on which are two representatives each from Germany, England and the United States. He dwelt at some length on a suggestion brought forward by the progress of this committee's work that the various countries having affiliated societies for testing materials should be entitled to stamp their own specifications "Approved by the International Society for Testing Materials for Export Trade." This suggestion on being discussed at the Copenhagen Congress in 1909 failed to receive the approval of the English representatives. The German members of the committee were not present at this congress. Within recent months Dr. Moldenke, being in Germany, had discussed the matter informally with the German committeemen, who were willing to grant a request for the "stamp" in the way proposed, but only up to the next congress. Personally they expressed the hope that the American members would not make a request for stamping.

Following Mr. Wood's report discussion was had on the action of the Executive Committee of the American Society for Testing Materials, making the rule that no producer should be elected chairman of any committee of the society. This was discussed at length, and the outcome was a resolution recommending Walter Wood for re-election to the International Committee. Another resolution requested the Executive Board to reconsider its action in regard to the chairmanships of committees and remove the restriction upon producers. It was the sense of the committee that the maintenance of lines in the membership of the society, separating it into producers, consumers and unattached experts, is no longer necessary.

The Subcommittee on Locomotive Cylinders reported the desirability of a change in the specifications, and was asked to prepare desired amendments so that a letter ballot can be taken.

Employers' Liability Bill Passed by New York Assembly

The New York State Assembly passed last week by a vote of 117 to 5 the employers' liability bill of the Wainwright-Phillips Commission. It modifies existing statutes by abrogating the assumption of risk rule and by placing upon the employer the burden of proving the contributory negligence of the injured employee. It also makes the employer who has shop work done under the contract system liable for injuries to his employees or the employees of the contractor or sub-contractor where such injuries are due to any defect of the process, machinery or plant of the employer. A permissive compensation scheme is provided, under which employees consenting to it waive their right to bring an action at law, receiving under this arrangement compensation according to a prescribed schedule without regard to negligence. The schedule of such compensation provides for a payment in case of death to the amount of four years' wages, but not exceeding $3000. Injured employees receive a weekly allowance equal to one-half pay, but not to exceed $10 a week, nor to extend beyond a period of eight years.

The Assembly also advanced to third reading the Phillips compulsory compensation bill, which provides similar schedules of compensation for injury in certain specified dangerous employments. This bill, like the one passed, was recommended by the New York Employers' Liability Commission.

The National Association of Manufacturers urgently requests the attendance of manufacturers and other employers, regardless of membership in the association, at the discussion on the prevention of accidents and industrial liability insurance at the coming convention Tuesday afternoon, May 17, at the Waldorf-Astoria, New York.

The Westinghouse Lamp Company's Improvements

To meet the constantly increasing demand for its product, the Westinghouse Lamp Company is making extensive additions to its large modern plant at Bloomfield, N. J. These additions include an extension toward Clearfield avenue of the present storehouse and also a new building east of the present main manufacturing building.

The storehouse extension is to be 80 x 90 ft., five stories, with concrete walls conforming in appearance to those of the present plant. A floor system of substantial timber construction carried on a steel frame will provide ample support for the heavy loads to which it will be subjected. The three lower floors are to be given over to storage. Of the two remaining floors one is to be used as a laboratory and one as a restaurant. The new building is to be 80 x 100 ft., one story. The walls are to be of concrete, the roof being carried on steel columns and steel roof trusses. This building is to provide new quarters for the machine and carpenter shops now located in the present main building.

With the completion of these new structures the present storage capacity will be practically doubled. The removal of the machine and carpenter shops, laboratories, restaurant, &c., will also allow the entire main building to be given over to the actual manufacture of incandescent lamps, thereby making possible a considerable increase in production. This larger production will require an increase in the number of employees from 1500, the present number, to about 2500. The highest grades of employees obtainable are used in this work and every modern convenience is provided for their comfort, such as ample light, heat and ventilation, an emergency hospital with a doctor in constant attendance and a restaurant where employees may obtain good food at cost. All buildings are equipped with the most modern type of fire protection. Work has already been started by the contractor, the Snare & Trieste Company, New York, and it is expected that the augmented plant will be in complete operation by August 1 of this year.

In addition to the increase at Bloomfield, the company is equipping as rapidly as possible its large New York City factory, which occupies the greater part of the block between Tenth and Eleventh avenues on Twenty-third street. It is expected that the New York factory will be in full operation by fall, at its estimated maximum capacity of 15,000 tungsten lamps per day.

The Wm. Cramp & Sons Ship & Engine Building Company, Philadelphia, launched May 7 the collier Cyclops, the first of three similar vessels building for the United States Government. The second is being built by the Maryland Steel Company, and the third by the Government at the Mare Island Navy Yard. These vessels are of the twin screw type, 542 ft. over all, 65-ft. beam and 39 ft. deep, and will have a carrying capacity of 12,500 tons of coal and 1000 gal. of oil.

The Standard Bridge Tool Company, manufacturer of the Thomas spacing table and other special machinery for fabricating structural steel, has moved its offices from the Ferguson Building to the Penn Building, Pittsburgh, Pa.

Obituary

CHARLES H. FERRY died suddenly at Phœnix, Ariz., May 2, aged 59 years. He was born at Utica, N. Y., was graduated from Yale, engaged in the practice of law in Chicago, but withdrew from the legal profession to give his attention to manufacturing. He was president of the Chicago Tire & Spring Company, Melrose Park, Ill., and conducted the business for a number of years, until the plant was taken over by the Latrobe Steel & Coupler Company, after which he removed to New York. He leaves a widow and two sons.

THOMAS J. CLARK, Haddam, Conn., vice-president of the Cutaway Harrow Company of Higganum, died May 4, aged 79 years. He was a native of Haddam Neck, Conn. A stonecutter by trade, he later was in business with his brother, George M. Clark, taking large contracts for stone structures, such as dams, bridges and mill buildings. In after years they engaged in the manufacture of farming implements, building up a large business. Mr. Clark was prominent in the affairs of his town, serving as first selectman and as a member of the State Legislature. He leaves a widow and five children.

JOHN W. WHEELER, Orange, Mass., president of the New Home Sewing Machine Company, died May 2, aged 77 years. He was one of the pioneer manufacturers of sewing machines, and was prominent in the development of the large industry at Orange. He served on the Governor's Council and in the State Legislature, and was president of the Orange National Bank and prominent in other financial and business institutions.

WALTER CRAIG KERR, president of Westinghouse, Church, Kerr & Co., Inc., New York, died in Rochester, Minn., May 8, aged 52 years. For two months he had been in Minnesota under treatment for cancer, and his death was the result of uremia setting in after an apparent convalescence from the effects of an operation. Up to the time he started for the West he was actively engaged in carrying on the business of the engineering firm with which he was associated. He was a graduate of the Engineering School of Cornell University class of 1879. After graduation he was an assistant professor of engineering in that institution until 1883, when he became connected with the Westinghouse companies. He was a trustee of Cornell University since 1890. Among the societies in which he held membership were the American Institute of Electrical Engineers, Canadian Society of Civil Engineers, American Society of Mechanical Engineers, Franklin Institute and Engineers, Cornell, Lawyers, New York Yacht, Railroad, Seawanhaka-Corinthian Yacht, Richmond County and Duquesne (Pittsburgh) clubs. He leaves a widow and four children.

CARL MCKINNEY, Scranton, Pa., died April 19, aged 68 years. He was born at Kutztown, Pa., was brought up in Scranton and rose from office boy to general manager of the Lackawanna Iron & Coal Company. When W. W. Scranton retired from that company in 1880 Mr. McKinney went also, and gave the new Scranton Steel Company the benefit of his practical experience as superintendent, continuing in that position after the consolidation of the two companies under the name of the Lackawanna Iron & Steel Company. In 1897 he became superintendent of the Maryland Steel Company's plant, but after four years returned to the Lackawanna Company as general manager, continuing until the Scranton plant was dismantled for removal to Buffalo in 1902. He leaves two sons and one daughter.

GEORGE F. PORTER, sales manager of the Atlantic Insulated Wire & Cable Company, 120 Liberty street, New York, died at his home in Montclair, N. J., May 2, aged 56 years. He was formerly secretary of the National Electric Light Association and at the time of his death was master of transportation for that organization. He leaves a widow and two daughters.

C. W. TILLINGHAST, president of J. M. Warren & Co., Inc., Troy Stamping Works, Troy, died April 27. He had been connected with the business for 70 years.

CHARLES A. TINKHAM, president of the American Bronze Foundry Company, Chicago, died at his home in that city April 29, aged 59 years. He leaves a widow and one son.

FREDERIC DEMMING OGDEN, secretary and treasurer of the Ogden Iron & Steel Mfg. Company, New York, died May 6, at Lakewood, N. J., of typhoid fever, aged 35 years. He leaves a widow.

A New Southern Iron Ore Development

The Pigeon Mountain Iron Company, recently incorporated, with a capital stock of $500,000, has purchased a tract of 3500 acres of red ore land, located about five miles north of Lafayette, Ga., between the lines of the Chattanooga Southern and Central of Georgia railroads. On the land purchased are three workable seams which are estimated to contain millions of tons of iron ore. It is the intention of the company to develop the mines and sell the ore for the present, although the erection of a blast furnace is contemplated. Joseph C. Haas, Montgomery, Ala., is president of the company; R. W. Watson, Atlanta, Ga., is vice-president, and Edwin Haas, also of Atlanta, is secretary and treasurer. The board of directors also includes W. A. Sadd, president of the Chattanooga Savings Bank; Charles A. Wickersham, president of the Atlanta & West Point Railroad; W. H. Patterson, vice-president of the Central Bank & Trust Corporation, Atlanta; Dr. J. M. Crawford, Atlanta; David Strauss, of M. Rich & Brothers Company, Atlanta, and I. Liebman, Atlanta Paper Company.

President Haas states that the company began to mine the ore experimentally about four months ago, and was so well pleased with the low cost of recovery and high percentage of soft ore that immediate steps were taken to build a railroad to connect with the Central Railroad of Georgia, a distance of three miles. The road is completed, about 10,000 tons of ore are ready for shipment, and the company will continue to mine at the rate of about 500 tons a day, which will be increased to 1000 tons in a few months. Analyses of the soft ore on this property show an average of over 50 per cent. of metallic iron. So vast is the quantity of ore than can be recovered by the use of plows, scrapers and steam shovels that underground mining will not have to be resorted to for many years.

The American Iron and Steel Institute

The secretary, W. J. Filbert, gives notice that the postponed annual meeting of the American Iron and Steel Institute will be held at the Waldorf-Astoria, New York, at 4 p.m. Friday, May 27, 1910, for the election of 10 directors of the first and second classes respectively. Nominations for directors will be made by a committee consisting of E. H. Gary, C. M. Schwab and E. C. Felton. A proxy committee has been appointed consisting of E. H. Gary, C. M. Schwab and Edward Bailey. On the evening of May 27 at 7.30 the institute will give a reception and banquet to members at the Waldorf-Astoria. The committee in charge of arrangements for this event consists of E. H. Gary, C. M. Schwab, E. A. S. Clarke, Powell Stackhouse and E. C. Felton. It is expected that an important meeting of the institute will be held next fall, to which prominent foreign manufacturers will be invited.

Canada's Iron and Steel Imports

Canada's trade returns for the 11 months period ending with February have been published. Several of the items under the head of iron and steel imports are interesting. Of rails, 34,542 tons, valued at $1,000,001, were imported from the United States, as against 11,465 tons, valued at $284,063, from Great Britain. That is, notwithstanding that the rate of duty was one-third less on rails coming from Great Britain than on rails coming from the United States, this country sent into Canada three times as large a quantity as Great Britain did. Yet, as will be noticed, the British rails are valued $3 a ton less than the American rails; hence, between tariff preference and price concession, there was an apparent advantage of more than $5 a ton in favor of the British rails. Evidently, the ruling considerations in the minds of Canadian buyers were promptness of supply and saving in freight charges. Similarly, the imports of fish-plates and tie-plates were strongly in favor of the United States, the value of those coming from this country being $114,409, as against $22,954 from Great Britain. Of rolled iron or steel angles, tees, beams, channels and other rolled shapes or sections the imports from the United States amounted to $1,956,101, and from Great Britain $542,584. In the articles named below the comparison is as follows:

	United States.	United Kingdom.
Hoop, band, scroll steel	$258,318	$6,588
Sheets and plates	663,189	243,384
Sheets and strips	784,623	.....
Galvanized sheets	615,814	.....
Skelp for steel pipe	1,289,940	.....
Steel billets	432,979	6,768
Tubing	1,126,939	83,300
Plate for bridges	279,971	.....
Steel for milling cutters	346,457	.....
Steel scrap	101,624	55,966
Twisted wire	48,488	242,419
Covered wire	141,052	152,258
Stoves	422,568	4,380
Cutlery	129,267	388,535
Agricultural implements	2,150,507	.....
Railroad axles	91,890	26,792
Bar iron and steel	1,316,331	330,643
Butts and hinges	56,288	560
Canada plates	177,630	.....
Castings	310,402	43,143
Cast iron pipe	50,816	257,199
Cast scrap iron	58,995	80,050
Chains	85,334	90,472
Locomotives	266,653	32,548
Gasoline engines	818,370	24,732
Steam engines	194,122	29,426
Steam boilers	110,846	111,939
Other boilers	96,498	12,482
Fire extinguishing machines	74,427	161
Steel pipe fittings	308,817	14,470
Hardware	375,078	48,741
Iron or steel ingots	36,645	14,320
Bridges or worked parts	86,703	31,795
Pig iron	700,984	1,224,418
Locks	293,080	6,415
Automobiles and parts	1,406,322	81,534
Mining machinery	234,566	5,753
Portable engines	1,475,529	6,077
Steam shovels	78,161	.....
Threshing machine separators and parts	915,139	.....
Sewing machines and parts	329,610	34,956
Typewriters	591,904	.....
Typesetters	238,384	.....
Paper cutting machines	163,096	4,358
Lithographic presses	56,441	920
Printing presses	268,615	10,837
Knitting machines	485,633	261,877
All other iron or steel machinery	5,569,488	486,708
Adzes, &c	50,443	6,173
Saws	67,784	1,087
Axes	31,272	.....
Files and rasps	62,859	11,157
Other tools	461,317	36,135
Other steel wares	3,896,866	336,372

Years ago it was possible to gauge somewhat closely the consuming capacity of the Canadian market by the magnitude of the imports. These nowadays give little indication of the extent of the demand, so largely do domestic products contribute to the satisfying of the demand, which has increased enormously under every head. The Canadian field of operations for United States sellers of iron and steel is mainly Ontario and the West, the East being tributary to the Cape Breton plants and to British traders.

C. A. C. J.

Improvements at Gary, Ind.

Fifth avenue, the principal east and west street in Gary, is being extended westward about two miles from Broadway to the intersection with the Wabash Railroad. Work on the grading is now under way, and it will be paved with macadam. From the western end of this improvement a street not yet named is being graded north to the plant of the American Bridge Company. Fifth avenue will be about three and a half miles long when this improvement is completed, extending from a point opposite the American Bridge Company in the western part of the city to the plant of the American Locomotive Company in the eastern part.

A new subdivision has been opened by the Gary Land Company on a tract south of the American Bridge Company. To provide necessary accommodations for men employed in the bridge works, the Gary Land Company will erect 250 houses. A new straight channel will be excavated for the Grand Calumet River. About 10 miles of the main track of the Lake Shore Railroad was moved bodily, at the beginning of operations at Gary, to make room for the steel mills in the location desired along the lake, and it even appears that rivers must be changed in their courses to conform with the plans of the new city.

The American Steel & Wire Company has relinquished the site reserved for it on the lake front, adjoining the Indiana Steel Company. The ground has been taken by the American Sheet & Tin Plate Company and added to its site for the new sheet and tin mills which will be erected there.

The Strength of Wire Rope

The American Steel & Wire Company, Chicago, announces a new standard of strength for wire rope based upon a new method for obtaining the figures. Heretofore the breaking strengths of different forms of wire rope manufactured in the United States have been measured upon the basis of the strength of the individual wires in the rope. The new standard of breaking strength is based upon the average of the different sizes and kinds of wire rope as obtained by actual tests made upon a large number of specimens, and these figures now represent the standard adopted by all makers of wire rope in the United States. In no case has the intrinsic strength been reduced, but the new method of figuring was adopted to meet the desire for more convenient and direct figures.

This new standard should result in giving more accurate figures as to the capacity of a wire rope, as, while the individual wires will support a certain weight without breaking, when these wires are put into a rope their capacity is somewhat weakened because of the indirect pull on the wires, and, further, all of the wires are not always under the same stress at the same time. Details of this method of measuring the standard breaking strength and the data for the various kinds of ropes manufactured by this company are given in the *American Wire Rope News*, issued May 1, by the company's sales department.

The Baltimore & Ohio Railroad Company has awarded a contract to James Stewart & Co., New York, for a reinforced concrete dock and an ore storage and handling plant to be constructed at Lorain, Ohio.

The Atlantic City Supply Convention

ATLANTIC CITY, N. J., May 11, 1910 (*By telegraph*).—The opening session of the joint convention of the National Supply & Machinery Dealers' Association and the American Supply & Machinery Manufacturers' Association was delayed this morning until 11.30 o'clock because of late arrivals of trains bringing important members. A note of cheerfulness was struck at the commencement of the meeting when the presidents of the two associations spoke briefly in the cause of harmony and co-operation and the gloom of the weather conditions was forgotten.

W. M. Pattison, Pattison Supply Company, Cleveland, president of the Dealers' Association, opened the session and, after the singing of "America," Rev. Dr. John R. Davis of Philadelphia offered a prayer. Mr. Pattison then formally welcomed the delegates. He said in behalf of his association that he came to the meeting with an olive branch in each hand. S. H. Browning, Ohio Valley Pulley Works, Maysville, Ky., president of the Manufacturers' Association, said that the keynote of the convention should be co-operation and his association would, he assured the meeting, strive to carry out that policy.

President Clark of the Southern Supply & Machinery Dealers' Association, who is attending the meeting in behalf of his association, when called upon said that he might be heard from later, but at that time he had nothing to say beyond the fact that the organization he represented desired to act in unison with the national body of machinery and supply dealers.

The delayed opening brought about a curtailment of the morning's programme, and the time set aside for a general exchange of opinion under the head of a competition discussion which might have proved interesting was cut down. This afternoon the two associations will hold executive sessions; to-morrow morning a joint meeting will be conducted by the manufacturers with the dealers present, and later the dealers will meet in executive session. Separate executive meetings will be held Friday morning and in the afternoon of that day the Dealers' Association will elect officers.

Advances in Railroad Rates

New railroad tariffs have been filed with the Interstate Commerce Commission by Western trunk lines, representing increases in Western territory ranging in the main from 15 to 20 per cent. and representing in some cases 25 per cent. advance. Some 400 commodity rates between Chicago, St. Paul and Mississippi River territory and Kansas City, Omaha and Missouri River territory are raised by the new schedules. These changes in rates between Missouri and Mississippi River transfers will increase the through rates from these points to the Atlantic and Pacific coasts. While the reason given for the advances is the increase in wages generally granted by the railroads, a Washington dispatch says that the members of the Interstate Commerce Commission interpret it to mean that the railroads are forestalling the operation of the new railroad bill, which gives the commission power to enjoin a rate. Advances made before the proposed legislation is enacted would remain operative until passed on in regular course, which might involve a long period of operation.

The Quebec Bridge.—The Canadian Minister of Railways received a cablegram May 5 from Engineer Fitzmaurice, now in England, stating that he and his fellow members of the board of experts appointed by the Government to supervise plans and construction of the Quebec Bridge had decided after making careful tests that the cantilever principle is the one that would be adopted. The other members of the board, Messrs. Modjeska and Vantilet, agree that the tests made in the United States and in England are conclusively in favor of the cantilever design. The Government has, therefore, decided to call for tenders for construction in accordance with that design. About three months will be given as the time within which tenders will be received. Every tender must be accompanied by a substantial guarantee that the bridge will be constructed according to specifications, and that in the case of any failure the contractor will have to bear the loss.

The Lake Superior Iron & Chemical Company

Negotiations have been in progress for some time looking to the acquisition of the Lake Superior Iron & Chemical Company, formerly known as the Berry interest. The purchasing syndicate is said to be made up of English, Canadian and New York capitalists. The company operates charcoal blast furnaces at Ashland, Wis., and at Chocolay, Boyne City, Elk Rapids, Manistique and Newberry, Mich. The annual capacity of the six furnaces is 199,000 gross tons of foundry, car wheel and malleable charcoal pig iron. Charcoal kilns are connected with all the furnaces except the one at Boyne City, and the company also has extensive plants for the manufacture of wood alcohol and acetate of lime. It has over 200,000 acres of timber lands in Michigan and Wisconsin, together with iron ore and railroad holdings. The general offices are at Detroit. The statement is made on behalf of the company that negotiations have not yet been closed.

The receiver for the Central Foundry Company, Waddill Catchings, has been authorized by the United States District Court to continue the business in whole or in part until September 1. While he reports that the general conditions of the soil pipe business are becoming worse, and that it will be a matter of difficulty to operate the business with any substantial profit, he has realized profits of nearly $2000 a week since he took charge, and believes in keeping the plants in operation to protect the interests of creditors. From February 12 to April 23 the receipts of the business, including cash on hand, were $493,649, and the expenditures $448,676, leaving a balance on hand of $44,973. The receiver has made a saving in salaries of $45,000 a year and in rent of $6000 a year.

The Bessemer Gas Engine Company, Pittsburgh, with plant at Grove City, Pa., has contracted with the Penn Bridge Company, Beaver Falls, for another steel building, 100 x 160 ft., as an addition to its foundry. It will have a 100-ft. crane runway for a 25-ton electic crane, not yet bought. It will be equipped with a 20-ton Whiting cupola. The company has important Western trade, and is arranging to establish a large plant at Oklahoma City, Okla., having a main machine shop, 260 x 300 ft., and a foundry, 100 x 200 ft. A decision is to be reached next week. The proposed plant would require a full complement of machinery, cranes, &c., and would employ 500 hands.

The second five mills in the new tin plate plant of the McKeesport Tin Plate Company, McKeesport, Pa., were started last week. The company now has a total of 20 hot tin mills, all of which are in operation. It has entirely remodeled its original plant of 10 mills and made a number of improvements. These include a complete new annealing department, stokers in the boiler room and other equipment. The improvements and additions to this plant were in charge of S. Diescher & Son, consulting engineers, Pittsburgh. The work of building the 10 new mills was started last September and completed in about eight months.

The General Electric Company

The Report for the Last Fiscal Year Shows a Gain of $7,115,955 in Sales and $1,691,419 in Net Earnings

The report of the General Electric Company for the fiscal year ending January 31, 1910, being the eighteenth annual report, shows the following results as compared with the previous year:

	1909-10.	1908-9.
Total receipts	$54,102,051	$47,168,469
Expenses, interest, &c.	47,608,380	42,366,217
Net earnings	$6,493,671	$4,802,252
Dividends	5,214,352	5,214,026
Surplus	$1,279,319	*$411,774
Previous surplus	16,102,062	16,513,836
Total surplus	$17,381,381	$16,102,062

* Deficit.

The consolidated balance sheet given below shows the condition of the company as of December 31, 1909:

Assets.		
Patents, franchises and good-will		$1.00
Cash		17,623,466.72
Stocks and bonds	$22,329,663.71	
Real estate	118,063.34	
(Other than factory plants.)		
Notes and accounts receivable	19,377,972.37	
Work in progress	462,223.41	
	$42,287,922.83	
Merchandise inventories:		
At factories	$21,610,283.91	
At general and local offices	3,321,870.94	
Consignments	217,880.98	
	25,150,035.83	
		67,437,958.66
Factory plants (including all lands, buildings and machinery)	$14,330,958.12	
Copper mining investment	3,048,604.41	
		17,379,562.53
Total		$102,440,988.91
Liabilities.		
5 % debentures of 1892		$40,000.00
3½% debentures of 1902		2,047,000.00
5 % debentures of 1907		12,875,000.00
Accrued interest on debentures		83,664.58
Accounts payable		2,753,617.30
Advance payments on contracts		777,133.34
Dividend payable January 15, 1910		1,303,592.00
		$19,880,007.22
Capital stock issued		65,179,600.00
Surplus		17,381,381.69
Total		$102,440,988.91

During the year there was expended in acquiring sundry patents, for cost of applications and licenses under patents, and in patent litigation and miscellaneous expenses $904,207.34. This amount has been charged to profit and loss, leaving the company's patents, franchises and good-will standing at a nominal valuation of $1, the same as at January 31, 1909.

The company has no note payable, nor is there any paper outstanding bearing the company's indorsement.

The Sales Department

Vice-President J. R. Lovejoy, in charge of sales, says relative to turbines: "The Curtis steam turbine is installed in more than 650 central distributing stations and power plants throughout the world, having a total capacity in excess of 1,750,000 hp. The introduction of new designs of Curtis turbines for various purposes has been rapid and successful. Our low and mixed pressure Curtis turbines have proved most economical and satisfactory in operation. The interborough Rapid Transit Company of New York purchased of us and now has installed in its Fifty-ninth street station three low pressure turbines of 10,000 hp. capacity each. The economy of these turbines is better than expected and their operation is eminently satisfactory to the purchaser. Since the close of the year the Interborough Company has ordered from us two additional units of the same type and size."

For the past six years the sales billed have been as follows:

	Sales billed.		Sales billed.
1905	$39,231,328	1909	$44,540,676
1906	43,146,902	1909 (11 months ending December 31)	51,656,631
1907	60,071,883		
1908	70,977,168		

During the first six months of the fiscal year just closed orders received were at the yearly rate of $49,769,000, and for the last five months were at the yearly rate of $69,670,000.

The number and value of important contracts taken during the year were greater than for the previous year. The business came largely from existing public utility companies requiring apparatus and materials for the extension and improvement of their service, and from industrial companies for lighting and power purposes, rather than from new enterprises. The sales of supplies extending over many thousand items, all catalogued and listed, of which meters, transformers, arc lamps, wiring devices and repair parts of electrical machinery are the most important, were 117.3 per cent. of the previous year and 90.5 per cent. of 1907.

The Manufacturing and Engineering Department

Vice-President E. W. Rice, Jr., in charge of manufacturing and engineering, states that in the 11 months ending December 31, 1909, expenditures aggregating $2,878,942.37 were made for buildings and extensions, of which the details are given as to the several plants, and for additional machinery, patterns, special tools, fixtures, &c. The following table shows approximately the total area in square feet of floor space and the number of employees as of January 31 during the last five years:

	Floor space.	Employees.
1906	4,350,000	22,500
1907	4,770,000	28,000
1908	6,460,000	20,000
1909	7,000,000	23,300
1909 (December 31)	7,180,000	30,000

From that part relating to engineering the following extracts are taken:

"The apparatus which we have supplied for use in the economical distribution of electricity over very long distances has continued to give general satisfaction. Our engineers have improved the design of devices required in such installations, which must be capable of successful operation at the enormous electric pressure of 100,000 volts and over. Some of the largest of these long distance installations cover a territory of over 20,000 square miles, and supply light and power to many different communities with a combined population of more than 1,000,000.

"Our engineers have redesigned and greatly improved our line of mining locomotives, and the sales have shown a large increase over the previous year.

"The large 14,000-kw. high pressure turbines mentioned in my last report have operated in Chicago and New York with entire satisfaction, and additional orders have been received. Our engineers are at the present time engaged in the development of turbo-generators of a capacity of 20,000 kw. each.

"Our engineers have been particularly successful in the design of large sized electric motors for the performance of unusually heavy work, such as the rolling of rails, steel billets, &c. The installations which we have made of this character have proved economical, reliable and highly satisfactory to the purchaser. As a result, our engineers have been called upon to design motors for many new applications of this same character."

The President's Comments

President C. A. Coffin briefly reviews the excellent financial showing made by the company and adds:

"A considerable sum was expended during the year in acquiring United States patents on foreign inventions relating to incandescent lamps and processes of manufacture, by which the company expects to maintain its high position in this branch of the business. The capacity of many of the departments in our factories is still considerably in excess of the present rate of production, and the factory facilities cannot be fully employed until the volume of orders received is considerably increased."

Darley Suction Conveyor for Coal and Ashes

The Installation for the Boston Elevated Railway

The suction conveyor shown in the accompanying illustrations is designed for the rapid and cleanly handling of ashes, coal, cement clinker, and other materials, particularly those of abrasive or corrosive characteristics which consequently are not suited to mechanical conveyors. The installation described in detail in this article, for the removal of ashes and coal sifting from the Roney stokers under the boilers of the Charlestown power station of the Boston Elevated Railway Company, is typical of the system employed by the Darley Engineering Company, 140 Cedar street, New York. A conveyor pipe running beneath the floor in front of the boilers leads either to an ash separator or storage tank, or to the coal separator, as determined by suitable dampers. A powerful exhauster pulls a current of air through the pipes. An intake or feeder opening with suitable cover is located before each boiler at the front of each grate. Ashes or coal siftings are shoveled into the openings and are carried by the air blast to the separator, or storage tank, where a water jet automatically quenches the ashes and eliminates practically all of the dust, a dust collector further purifying the blast before it reaches the atmosphere. The ash separator in this case is a rectangular concrete bin, having a capacity of 25 tons, and is located so that its contents discharge by gravity into cars. The coal separator discharges by gravity into the coal handling apparatus of the plant and its contents go back to the bunkers.

Fig. 1 shows the principle of the system, but in its application to a small plant and for the removal of ashes only. Fig. 2 is the dust collector of the Boston Elevated Railway plant; above it is the air pipe from the separator and beneath appears the pipe leading the cleansed air to the exhauster. Fig. 3 is the coal separator, located on the top of the building and arranged to discharge into the coal carrying system. Fig. 4 is a ground plan and Fig. 5 an end section of the Charlestown plant, showing the system of piping and general layout of the system. Fig. 6 gives details of the dust

Fig. 2.—The Dust Collector of the Boston Elevated Railway Plant, at Charlestown.

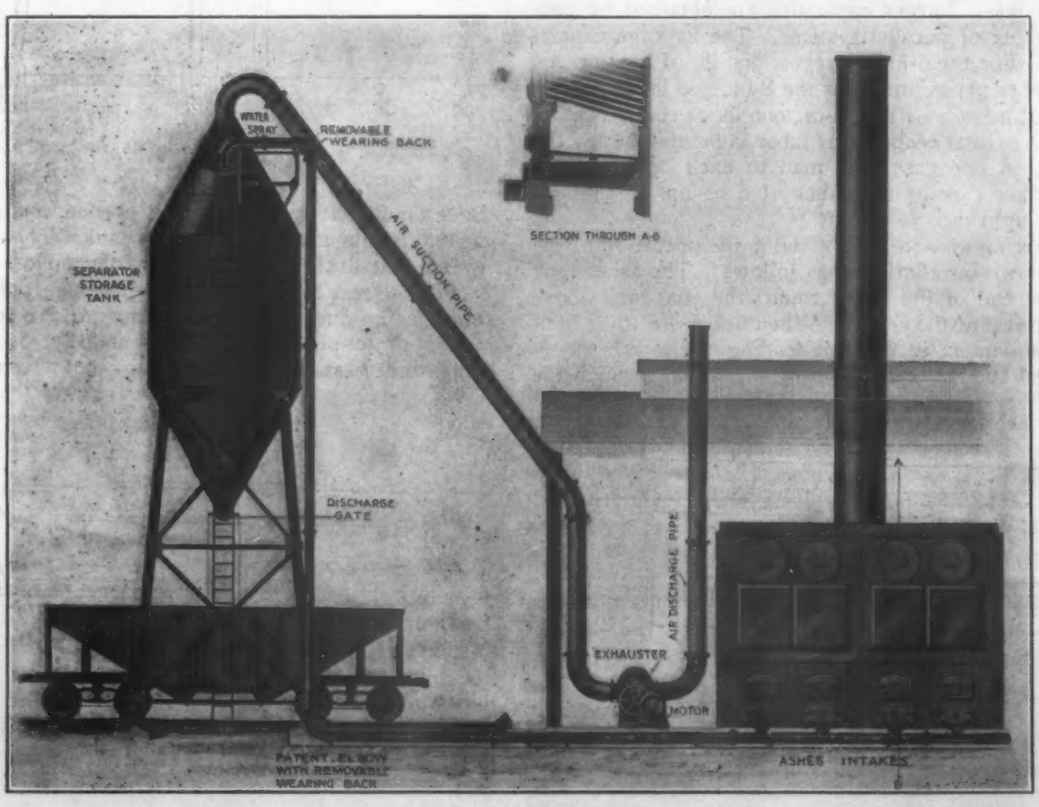


Fig. 1.—The Darley Suction Conveyor, as Applied to a Small Plant and for the Removal of Ashes Only.

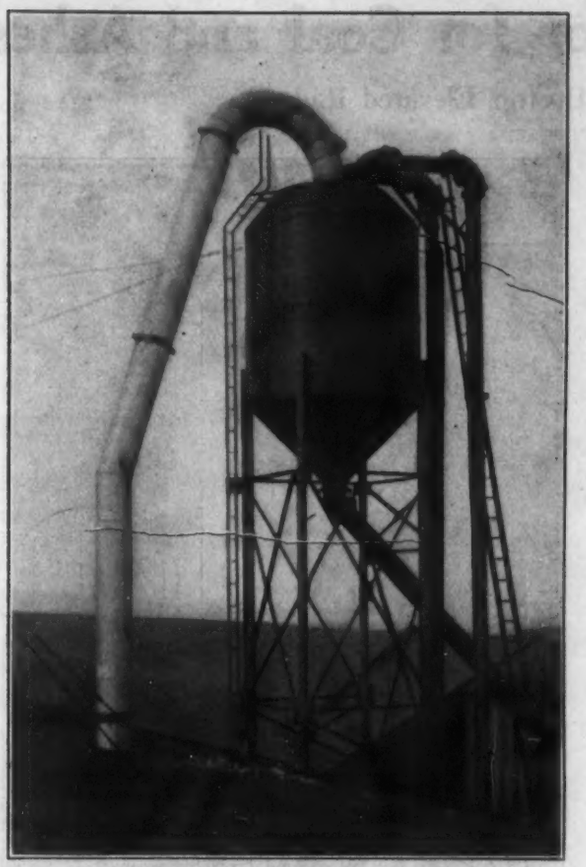


Fig. 3.—The Coal Separator, Located on the Top of the Building and Arranged to Discharge Into the Coal Carrying System. —At the Right Are Two 8-In. Incoming Conveyor Pipes with Water Sprays at the Last Elbows, the 18-In. Exhausting Pipe at the Left Leading to the Blower.

collector. Fig. 7 presents details of the intake openings and their covers. Fig. 8 shows the exhauster set and Fig. 9 is a view of the boiler room.

Generally speaking, the Darley apparatus may be used as a separator for separating any fine and coarse material of different specific gravities. It is also applied as a coal conveyor, for capacities of 25 tons per hour or less. Larger capacities are obtained by running duplex or parallel systems. The average capacities are: For the 6-in. conveyor, 300 lb. of coal or 200 lb. of ashes per minute; for the 8-in., 500 lb. of coal or 300 lb. of ashes; for the 10-in., 900 lb. of coal or 500 lb. of ashes. Great economy of labor is pointed out by the builder; in one case, one man to each of two daily shifts takes care of the ashes of 6000 hp. boilers, replacing eight men to a shift.

Referring now to Figs. 4 and 5, the operation of the Charlestown installation is as follows: The ashes tank is at the end of the boiler room; the coal tank above the platform at the center. When ashes are to be handled, the damper in the pipe leading to the ashes tank is opened and air is drawn from that tank, through the dust collector and expelled by the exhauster into the stack. This induces a powerful draft in the conveyor ducts, and ashes may be fed either into the duct running from boiler No. 10 past boiler No. 4 to the tank, or to the duct running from boiler No. 11 past No. 5 to the tank, or from that extending past boilers Nos. 3, 2 and 1. In any case the water spray at the separator tank quenches the hot ashes, lays the dust, and the air is finally cleansed by the dust collector before passing to the blower. When coal is to be handled the damper

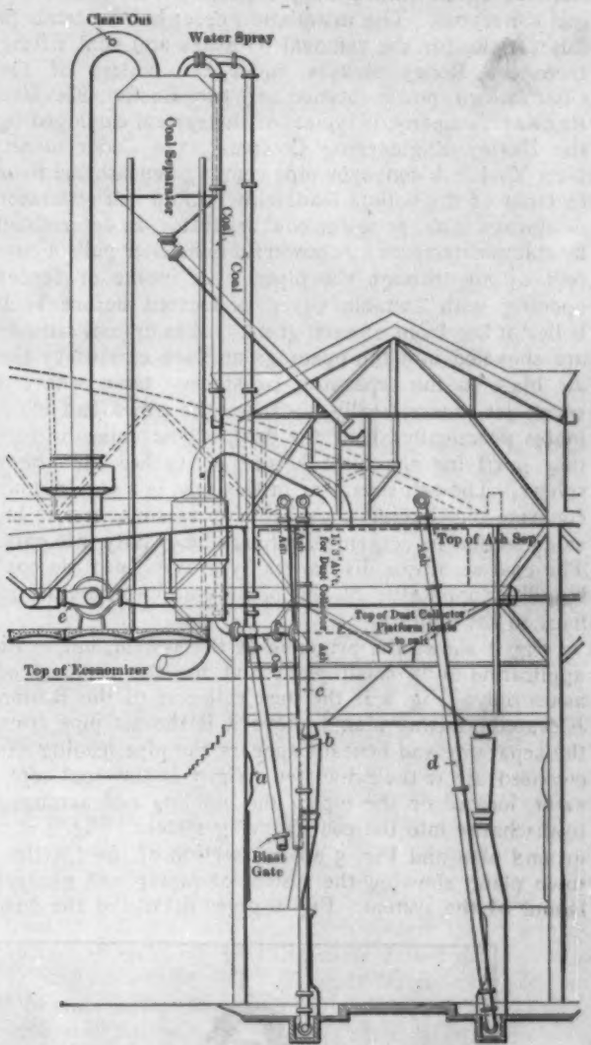


Fig. 5.—An End Section of the Charlestown Plant.

in the air pipe to the coal tank is opened, and a partial vacuum is thus maintained in that tank. This, as seen, reverses the draft in the pipe for boilers Nos. 1, 2 and 3. For the rest of the boilers, a pivoted section of pipe connects the duct to pipe *a*, leading to the coal tank, instead of to pipe *b*. The dust collector is omitted, being unnecessary when handling coal. The water

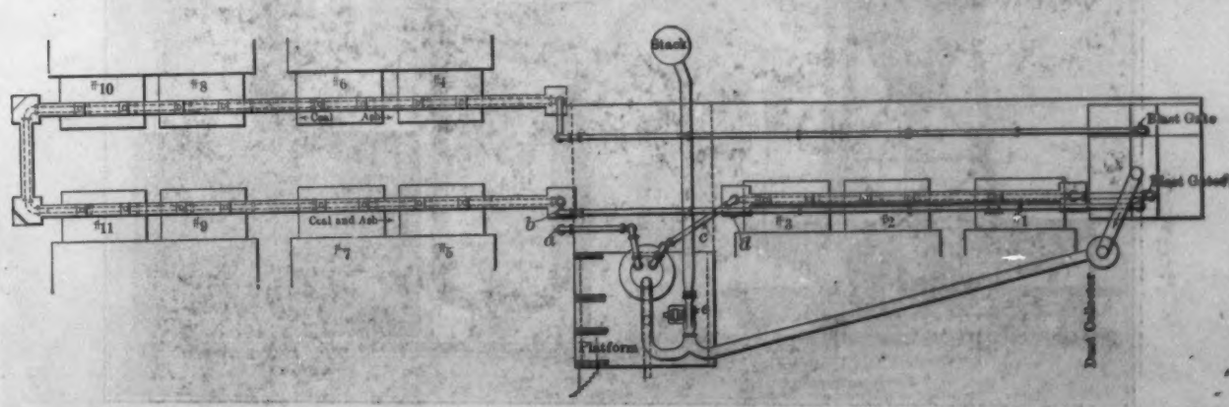


Fig. 4.—Ground Plan of the Charlestown Plant.

spray is used only when the coal is exceedingly dusty.

The pipes, which are of steel, are run as far as possible in straight lines to concentrate wear at the elbows. An important factor of the system is a patented split

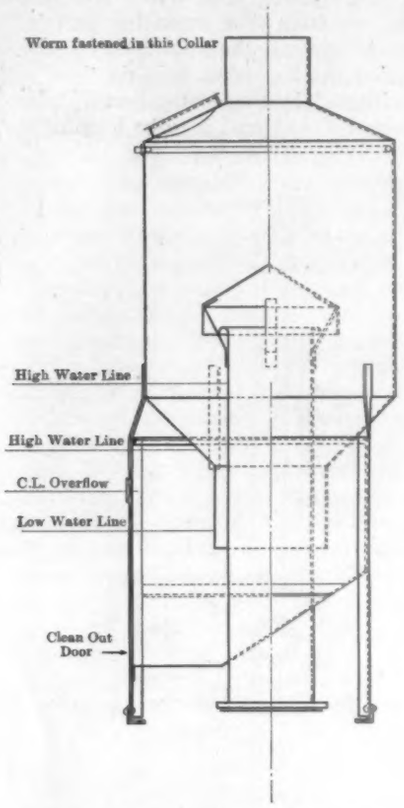


Fig. 6.—Details of the Dust Collector.

elbow having an inserted wearing back of manganese steel 3 in. thick. These wearing backs last from 4 to 12 months, depending on the character of the ash, and are replaced at small expense.

An intake is placed directly in front of each ash pit. It has an iron cover, tight fitting but easily removable, the details of this construction being shown in Fig. 7. The ashes are hoed or shoveled from the pit into the openings, and disappear through the pipe line at high velocity. An 8-in. system will take the ashes as fast as one man can shovel them in. The intake opening is of smaller diameter than the pipe, and consequently any piece of material that passes the opening is freely conveyed to the separator. Large clinkers are broken with hoe or shovel on the intake hopper. In considering the wearing features of the system, it must be borne in mind that the higher velocity of air in the center of the pipe tends to keep the material in suspension away from the walls. None comes in contact with moving parts, and impact or erosion occurs only at the wearing backs. The system is dustless in its operation. The great rush

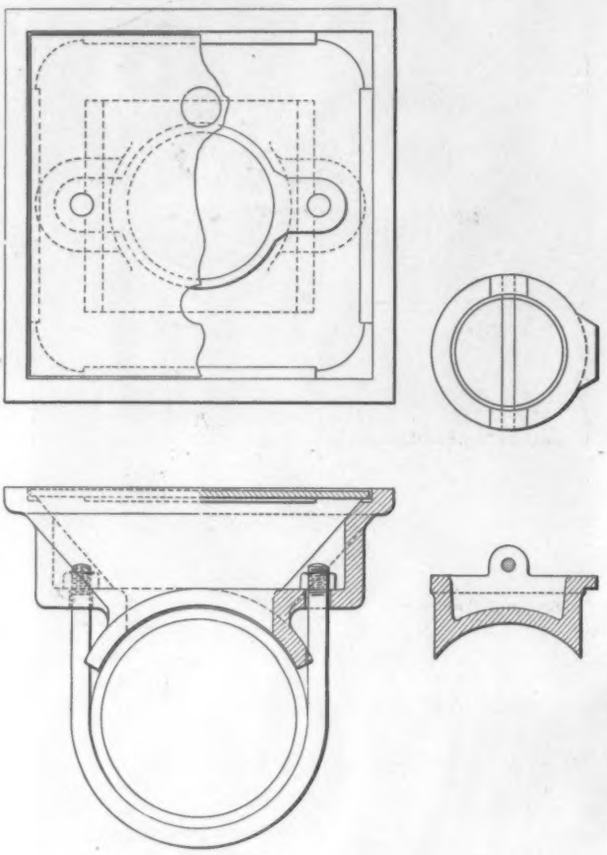


Fig. 7.—Details of the Intake Openings and Their Covers.

of air serves to keep the pipe dry, so that no corrosion can take place.

The exhauster consists of a rotating impeller in a suitable case with an intake and discharge opening. The Charlestown plant uses a motor driven machine, because of the availability of electric energy. The Darley Company ordinarily recommends an exhauster set specially designed for this and direct connected to

Fig. 8.—The Exhauster Set, with Inlet Pipe at the Left and Exhaust Pipe at the Right, Direct Connected to a 20 Hp. motor.

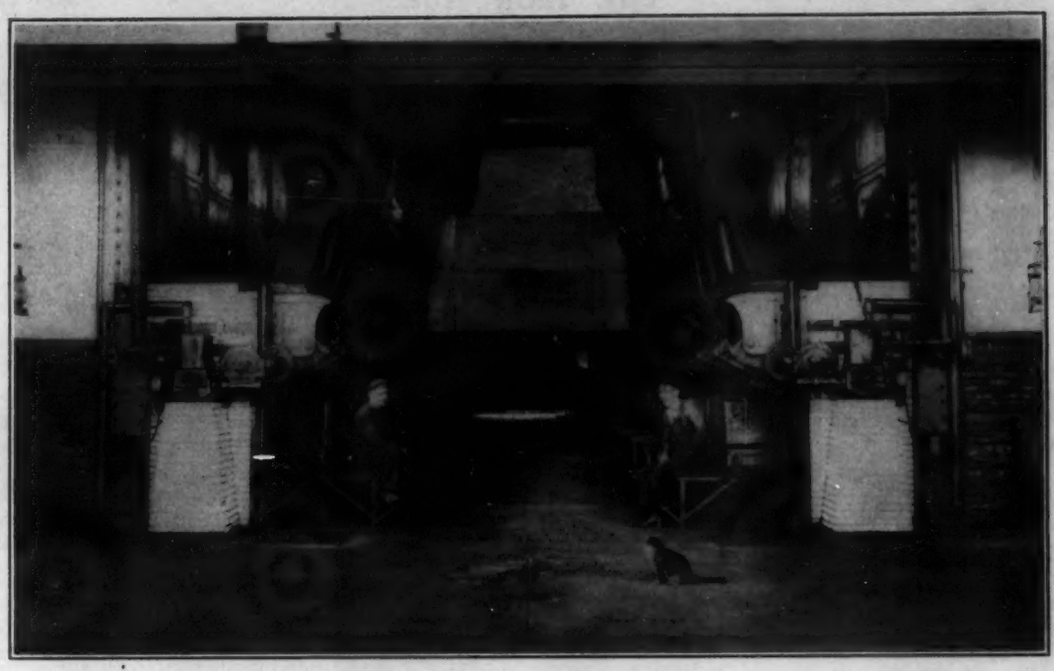


Fig. 9.—Interior of the Boiler Room.

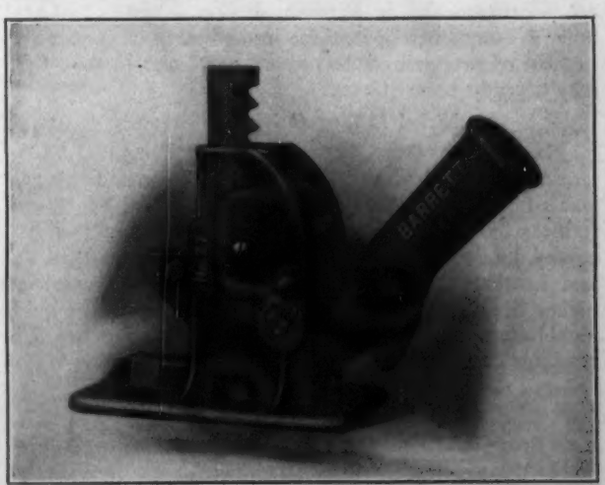
either a high speed electric motor or a steam turbine.

The separator is an expansion chamber and storage tank. Just before entering the material passes through a water jet, regulated to give the desired effect, located in the conveyor pipe, and consisting of ⅛-in. holes spaced 1 in. centers. The jet serves the two purposes of quenching hot material and of laying the dust.

From the separator the blast passes to the dust collector, details of which are seen in Fig. 6. At the top of the collector, in the entrance, is a worm which gives to the incoming air a whirling motion, driving the dust against the drenched walls of the upper chamber. This entrained dust washes down and collects at the bottom, while the cleansed air passes out through the central hooded pipe to the exhauster.

The New Barrett Track Jack

While considerable progress has been made within the last decade in railroad construction, the advancement made in the tools required for the maintenance of the track has not quite kept pace with it, and in many cases the section hand of to-day is using the same tools as those employed a quarter of a century ago. The Duff Mfg. Company, Pittsburgh, Pa., has recently brought out a new model of the Barrett track jack, which was especially designed for use on the electrified portions of the New York Central Lines in the vicinity of New York City. A third rail is employed to supply power to the trains, and it was therefore impossible to use an ordinary jack outside the track on the same side as the third rail, because of the danger of a short circuit.



The Barrett No. 27 Track Jack Made by the Duff Mfg. Company, Pittsburgh, Pa.

This new jack is more compact than the other models now on the market. Its hight when closed is 10 in., and when fully extended 5½ in. more. The weight is 55 lb. When the jack is in use and the base of the rail is resting upon the toe of the rack, the top of the rack and the top of the rail are on the same level, and enough clearance is provided between the rack and the rail to permit a car wheel flange to pass.

When the approach of a train makes it necessary to stop work, the jack can be dropped quickly and the wooden handle removed from its socket. The socket drops down out of the way and the jack can be left in position under the rail, ready to resume work as soon as the train has passed. A considerable saving in time is effected by not having to remove and reset the jack every time a train passes. For stretches of track where trains are very frequent or where the car movement is practically continuous throughout the entire day, as in a yard, these jacks should also be of great service. This advantage of the jack would be equally important in connection with steam road track work.

One of the largest hydroelectric developments in California has just become public with the awarding of a contract to the Allis-Chalmers Company, Milwaukee, by the Northern California Power Company, for the initial installation of machinery. The contract calls for all the machinery and accessories and will include three 7000-hp. 450 rev. per min., single horizontal turbines. The runners are 50 in. in diameter and the gate valves 42 in. in diameter. These turbines are each connected to a 5000-k.v.a., 6600-volt, 60-cycle, three-phase alternator. The turbines will operate under a head of 450 ft.

The net surplus of freight cars in the United States and Canada, as shown by the last bulletin of the American Railway Association, was 96,319 on April 27, as compared with 77,357 on April 13. This is the fifth consecutive fortnight in which a net increase was reported. It had been supposed that the effects of the coal miners' strike, reflected in the statement of April 13, had been eliminated for the most part in the next two weeks, and the increase in idle cars may be considered to be due largely to other causes.

Electric Furnaces of the Induction Type*

Progress with the Kjellin Furnace and the Röchling-Rodenhauser Modification Used for Large Tonnages

BY T. ROWLANDS.

The history of the induction principle is now so well known that it is unnecessary to more than point out that the first commercial furnace was put into operation in 1902 at Gysinge, Sweden. In the past eight years great progress has been made, and now it is quite recognized that the application of the principle has been established beyond all doubt, as furnaces of comparatively high tonnage are in active operation. At the present moment 16 tons capacity per charge is regarded as the maximum, although there seems no doubt that furnaces of greater capacity can and will be designed as necessity demands.

The simple induction furnace of the Kjellin-Colby design is intended for melting purposes only, as the bath forms an annular channel in a crucible of suitable refractory material, and the crucible is so designed to allow the center leg of the transformer, together with the primary coil, to pass through it. These furnaces are built to take charges from 10 lb. to about 3 tons. The construction of furnaces of greater capacity has been developed into the combined or Röchling-Rodenhauser type.

The Kjellin Furnace and the Crucible Process

This type of furnace is now running in competition with the crucible process for the manufacture of steel. Where power is moderately cheap, the cost of melting is very low as compared with the crucible process. The best practice in the old coke method of melting, as followed in Sheffield, shows that fuel and crucibles alone cost about $14 per ton, and in this country, using plumbago crucibles and working with gas producers, the cost is from $10 to $11 per ton.

Taking for comparison a medium sized induction furnace, capable of melting about 4 tons per 24 hours, pouring only 1000 lb. per cast and working on a high power consumption, we will allow a high cost for furnace lining as follows:

750 kw.-hours per gross ton at 0.5 cent. per kw.-hour	$3.75
Lining, per ton	1.00
	$4.75

It will be seen that the saving effected on melting, for fuel and crucibles only, amounts to from $5 to $10 per ton. The economy is even much greater, for, in the comparison, the power was taken at 0.5 cent, which is a high cost, and the consumption of 750 kw. hours is also very high; as will be seen later, when melting regularly, the consumption for tool steels is much lower, but a high figure is given in order to allow for adjustment of compositions on making alloy steel, and also to allow for melting medium and low carbon steels. Then, again, the labor question has not been considered. Excluding the labor for the casting pit, which is about the same in electric and crucible processes, the electric furnace hands are fewer, and it is quite the regular thing for one man and a boy to do all the work on a furnace tapping 1 ton each heat. The actual saving will be between $7 and $13 per ton of ingots.

The regularity of the composition of the steel is another factor in favor of electric melting. Any irregularity in the composition of the steel can be adjusted directly in the furnace before tapping. This, of course, cannot be so finely regulated in crucible practice. Bearing on this point, it would be as well to state the evidence given the writer by a friend, who has been operating in his department a furnace tapping about 3000 lb. per heat. He stated that the only charge he found it necessary to correct was the first one, as all the following charges were remarkably regular—always within a very narrow margin of the predetermined carbon percentage. High speed and other alloy steels are just as regular, and the loss is very much less than in the ordinary method.

When operating a 150-kw. furnace at Niagara Falls remarkable results were obtained. Several times the charge was ready within 1¾ hours from commencement of charging, and on more than one occasion in 1½ hours. Only on special occasions was the furnace pushed, for, as it was erected for demonstration purposes, the product was not marketed, but any one who wished could have what steel he desired.

On one of these special occasions a heat of over 1000 lb. of 1.2 per cent. carbon steel was charged and poured just under 1½ hours, the power consumption being only 440 kw. hours per ton. This result is exceptionally good, but with suitable arrangements for handling the product there is no reason why carbon tool steel should not be regularly produced with a consumption of under 600 kw. hours per ton.

Before leaving the subject of crucible quality steel, it might be well to call attention to the consideration this particular type of furnace is receiving in Sheffield. The first firm to take up the matter was Vickers, Sons & Maxim, Ltd., who erected a furnace of 250 kw. capacity, which, after preliminary trials, commenced active operations in the spring of 1908. About this time a committee of manufacturers was formed to go very thoroughly into the quality and costs of production of high-grade steel by electricity. A technical subcommittee visited electric furnace plants, the Kjellin furnace at Gysinge, Sweden, attracting much attention. They were very well satisfied with the material produced and as a direct result of their exhaustive tests and report a furnace of 300 lb. capacity has recently been put in operation in the metallurgical department of the Sheffield University.

Another of the large firms, always in the forefront on improvements, is William Jessop & Sons. They hope to commence operations immediately on a furnace capable of producing 8 to 10 tons per day. In fact, this may already have started.

Nickel Melting at Niagara Falls

Experiments were carried out at Niagara Falls, working with a 60-kw. furnace. The furnace lining was of magnesite, thoroughly baked in, and heated to redness by means of an iron ring. This ring was removed, molten nickel poured in, the current switched on and heating of the charge commenced. The molten nickel charge was 108 lb., and the charging of the cold nickel commenced at 2.15 p.m. The following are the readings taken:

Time.	Volts.	Amperes.	K. V. A.	Remarks.
2.15	135	300	40.5	Started to charge scrap, 50 lb.
2.25	144	350	50.3	
2.30	140	360	50.4	
2.35	135	365	49.2	
2.40	133	370	49.2	Charging finished.
2.50	133	370	49.2	
3.00	130	376	49.5	Shut down to change connections.

* A paper read at the meeting of the American Electrochemical society, Pittsburgh, May 5-7, 1910. An illustrated description of the Kjellin furnace appeared in *The Iron Age* of October 19, 1905, p. 1010.

Time.	Volts.	Amperes.	K. V. A.	Remarks.
3.06	120	350	42.0	Started.
3.15	120	350	42.0	
3.30	120	350	42.0	
3.45	120	350	42.0	
2.56	120	350	42.0	Teemed 43 lb. and took sample No. 1.
4.00	125	300	37.5	Started.
4.12	146	350	51.1	Started charging 50 lb. electrolytic nickel.
4.15	137	388	50.4	
4.18	124	375	46.5	Charging finished.
4.22	123	370	45.5	Complete melt.
4.24	106	325	34.5	
4.30	115	350	40.2	
4.35	115	350	40.2	Teemed 50 lb. Sample No. 2.
4.37	128	330	42.2	
4.41	128	330	42.2	Started charging 50 lb. electrolytic nickel.
4.45	132	337	44.4	
4.48	129	340	43.8	
4.51	130	350	45.5	
4.54	126	357	45.0	
4.57	125	360	45.0	
5.00	124	361	44.8	
5.03	122	362	44.2	
5.05	121	366	44.3	Charging finished.
5.06	122	368	44.8	Complete melt.
5.10	120	368	44.1	
5.20	94	342	30.2	

The metal was kept in a molten state, and the following morning at 11 o'clock sample No. 3 was taken. Nothing further was done until two mornings after-

Time.	Volts.	Amperes.	K. V. A.	Remarks.
7.00 a.m.	106	235	24.9	
7.30	112	250	28.0	
8.00	112	250	28.0	
8.20	112	250	28.0	
9.30	125	265	33.6	
10.05	127	265	33.6	
1.00 p.m.	126	255	32.1	
1.20	130	262	34.1	
1.30	150	300	45.0	
1.45	150	300	45.0	Sample No. 4.
1.47	150	300	45.0	Started charging 34 lb. electrolytic nickel.
1.50	148	307		
2.00	126	324		
2.10	126	300	37.8	
2.35	126	300	37.8	
2.40	148	350	61.8	
2.55	146	348		Charged 3 lb. manganese.
3.00	146	348		Teemed. Sample No. 5.

The samples taken showed:

	1st day. Per cent.	2d day. Per cent.	3d day. Per cent.	4th day. Per cent.	5th day. Per cent.
Metallic iron....	6.56	1.45	0.35	0.39	0.53
Nickel oxide....	Nil.	Nil.	1.25	15.95	11.40

Sample No. 1 shows a great deal of iron, which possibly occurred from iron scale falling from the

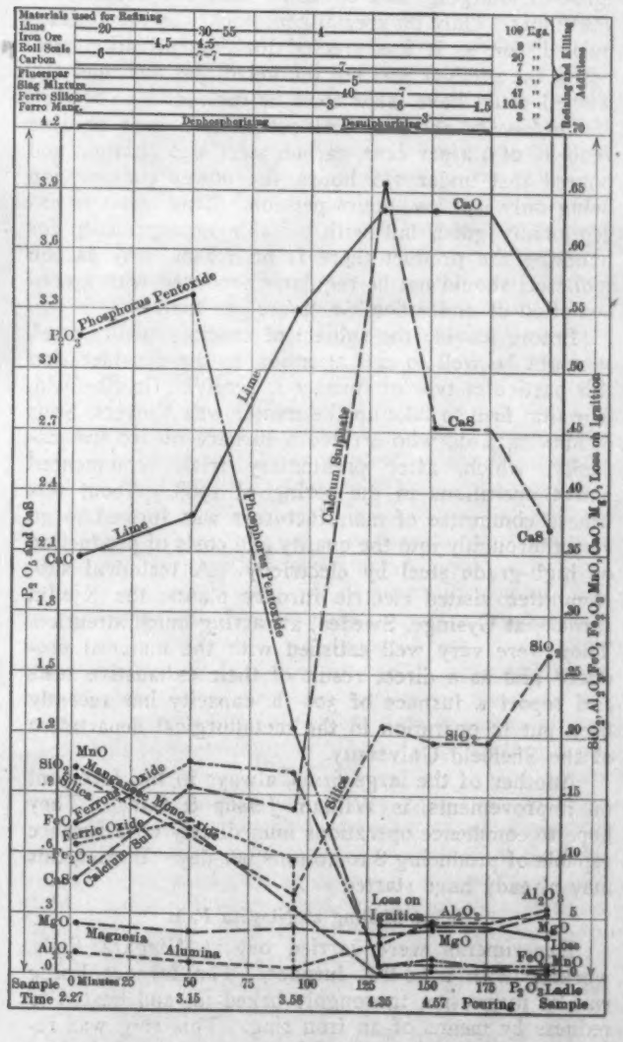


Fig. 1.—Refining of Basic Bessemer Metal in a 2-Ton Three-Phase Röchling-Rodenhauser Furnace at Volklingen, Germany.—Slag Samples.

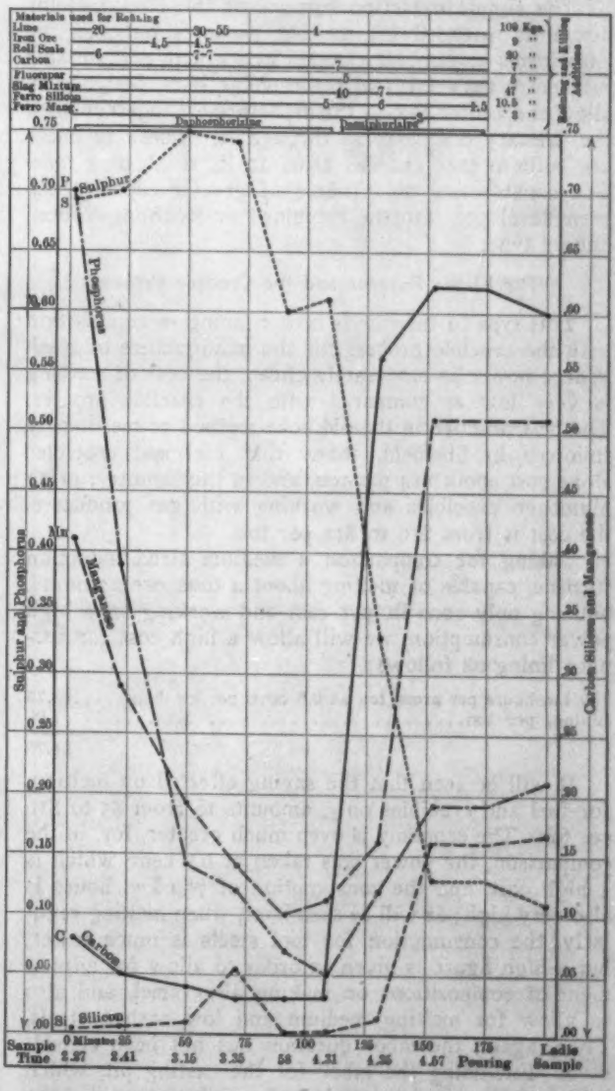


Fig. 2.—Refining of Basic Bessemer Metal in a 2-Ton Three-Phase Röchling-Rodenhauser Furnace at Volklingen, Germany.—Steel Samples.

ward, the metal meanwhile being maintained in a molten condition. This delay was caused by the absence of a New York gentleman who desired to witness the work, who was unavoidably detained, and the metal was kept melted awaiting his arrival. On the morning of the fourth day work was resumed, the following readings being taken:

baking-in ring. The iron decreased rapidly on charging further quantities of nickel and from other causes. It is not surprising that a great quantity of nickel oxidized, being kept molten for such a long period, and it is satisfactory to note the reduction of the amount of oxide on adding manganese. Another point which would affect the nickel was that the men who had to

watch the furnace over night were quite unfamiliar with the work and maintained too high a temperature, as they were afraid of the bath freezing.

It will be seen that the melting was very rapid for the first charge, although the furnace was not very hot, and, including delays, took only 1½ hours, and in the second we commenced charging 50 lb. at 4.12, obtaining a complete melt at 4.22 and teemed at 4.35.

This work was experimental and consequently we were not working under the best conditions. The furnace was giving a power factor of about 90 per cent., therefore it will be seen that with an average kilowatt

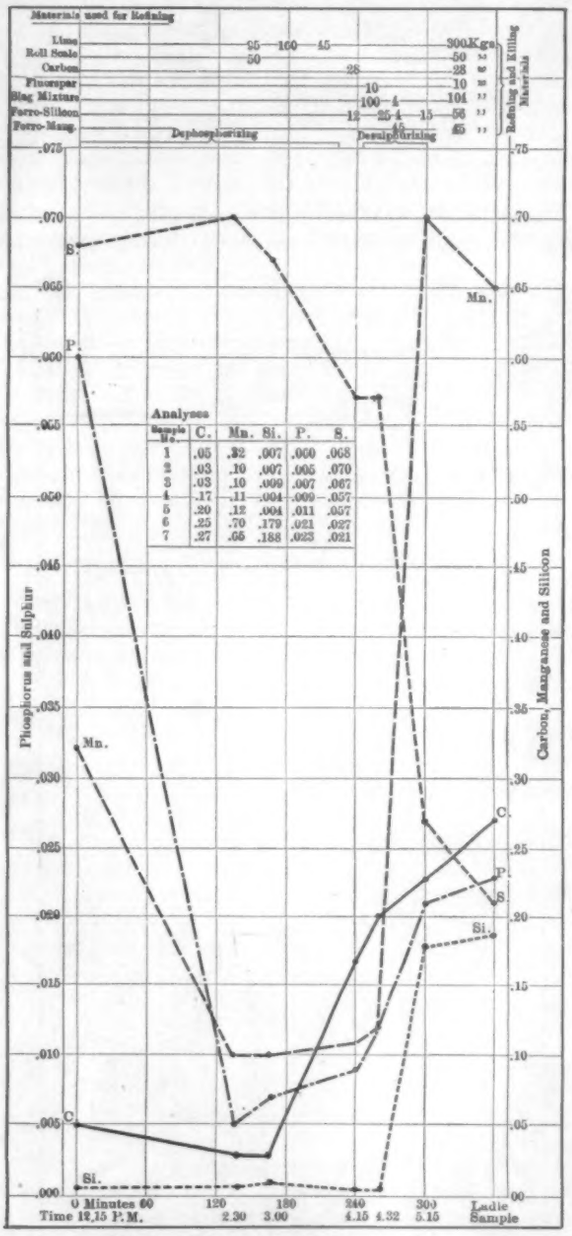

Materials used for Refining
Lime 95 160 45 300 Kgs.
Roll Scale 50 50 "
Carbon 28 28 "
Fluorspar 10 10 "
Slag Mixture 100 4 104 "
Ferro-Silicon 12 25 4 15 56 "
Ferro-Mang. 40 45 "
Dephosphorizing
Desulphurizing
Refining and Killing Materials
Analyses
Sample No. C. Mn. Si. P. S.
1 .05 .32 .007 .060 .068
2 .03 .10 .007 .005 .070
3 .03 .10 .009 .007 .067
4 .17 .11 .004 .009 .057
5 .20 .12 .004 .011 .057
6 .25 .70 .179 .021 .027
7 .27 .65 .188 .023 .021
Phosphorus and Sulphur
Carbon, Manganese and Silicon
Mn.
P.
S.
C.
Si.
0 Minutes 60 120 180 240 300 Ladle Sample
Time 12.15 P.M. 2.30 3.00 4.15 4.32 5.15

Fig. 3.—Refining of Basic Bessemer Metal in an 8-Ton Single-Phase Röchling-Rodenhauser Furnace at Volklingen. —Steel Samples.

of 48.4, the power consumption for this quantity was at the rate of 325 kw. hours per ton for melting only, which is very good for so small a furnace.

There are certain difficulties in melting the first charge, and to overcome them the first lot was melted in crucibles and poured into the furnace. I will refer again to this difficulty in my next paragraph.

Brass Melting

Very little work has been carried out in this country on brass and bronze, and on that account the information obtained is from England. The Grondal-Kjellin Company, Ltd., 20 Abchurch lane, London, E. C., worked on brass, and when the ordinary furnace was used were troubled with the "pinch effect," so well known to you all through the constant reference to it by Carl Hering, who has made a study of the phenomenon. They overcame the difficulty by using a special crucible, together with specially constructed coil on the furnace, whereby the electrical conditions could be so changed that at any desired moment most of the current could be carried either by the metal in the bath or by the crucible itself. By this arrangement the crucible is first heated, and when sufficiently hot the brass scrap is charged. This soon melts, completing a circuit. The switch is then thrown over and the metal itself carries most of the current; the crucible when exposed gradually becomes cooler, the cooling being visible.

After the first melt was obtained, 112 lb. of brass was charged and melted in about 30 min., with a power supply of about 30 kw., and twice the quantity only required 50 kw., melting in the same time. The first heating of the crucible required 42 kw. hours and took 1½ hours. The brass produced was remarkably sound and, when tested against that produced in the ordinary way, showed excellent results.

In addition to this work, other experiments have been carried out on a three-phase furnace, the lining being of firebrick. The result of these experiments shows a power consumption of 18 kw. hours per 100 kg., or about 185 kw. hours per gross ton. The "pinch" effect is far less intense in the use of three-phase current than with single phase. As this work is still being carried out, it is not possible to give final results at the present moment.

There are now several small simple induction furnaces at work in this country, and abroad they are in regular commercial use.

Several very able papers have been read on this subject, one of which was by Dr. Kjellin last year.* These go well into costs and give so many details that these particulars have been purposely avoided.

The Combination Induction Furnace

This is known as the Röchling-Rodenhauser furnace, and is used for melting and refining. The Röchling'sche Eisen & Stahlwerke, Volklingen, with their characteristic enterprise, were early in the field and erected an 8-ton Kjellin furnace. They wished to obtain for special purposes a higher grade of steel than they were producing in the basic Bessemer converter, and attempted refining in the Kjellin furnace. Owing to the construction of this they were unable to handle slags freely, and although able to refine, it was with great difficulty. The result was that the furnace bearing their name was evolved from the Kjellin furnace, and the capacity has increased until now they are working a furnace which takes the full output of their generator.

It is interesting to note that it was their intention to refine ordinary steel to obtain steel of somewhat better quality, and they did not intend commencing the tool steel business, but now, as they have had so many requests and orders for large quantities of the high grade quality, they have rapidly built up a large business and are erecting a new plant at a great cost to take care of this. It very soon became quite evident that the combination furnace had entered the field as a refiner and is now in the first rank, accomplishing work which skeptics regarded as impossible.

You will find, on referring to pages 173-204 of Vol. XV, 1909 *Transactions* of the American Electrochemical Society, a general description and costs of operation, &c., all of which can easily be followed by the help of the accompanying figures. The refining is also well shown, and the writer cannot add much new matter to that paper. However, a few particulars of observation personally made at the Volklingen Works may be of interest to you.

* *The Iron Age*, May 13, 1909, p. 1525.

At the time of the writer's arrival the 2-ton three-phase furnace was in operation. Two casts of nickel-chrome steel were made. The following day the charges were for the production of high-grade silicon steel. These were produced from metal obtained from the basic Bessemer converter. Figures on these runs were not taken. Wishing to get further particulars, samples of this heat were taken in order to follow up the refining, and at the same time electrical readings were also taken. These were as follows:

Refining of Steel in 2-Ton Three-Phase Röchling-Rodenhauser Furnace.

Time.	Amperes.			Volts.		Kw.	Power factor.	Remarks.
2.20								Charging molten metal.
2.30	128	128	130	310	320	45	0.70	
2.45	470	480	482	440	450	235	0.65	
3.00	490	495	505	485	495	275	0.65	
3.15	500	510	518	470	480	260	0.62	
3.30	495	510	510	460	465	250	0.61	
3.45	495	500	505	470	480	250	0.60	
4.00	485	495	506	470	480	272	0.67	
4.15	400	405	410	470	480	230	0.69	
4.30	373	377	390	490	500	205	0.63	
4.45	380	385	390	500	510	250	0.74	
5.00	505	508	518	475	485	263	0.63	
5.15	500	506	512	470	475	250	0.60	
5.18								Pouring out.

FURNACE OPERATIONS.

Weight of furnace and charge.....21,105 kilos.
Weight of furnace.....19,610 kilos.

Weight of molten steel..... 1,496 kilos.

2.25 Charging furnace.
2.27 Samples taken. Steel sample No. 1. Slag sample No. 1.
2.40 20 kilos lime and 6 kilos roll scale thrown on bath.
2.27 Sample taken. Steel sample No. 2.
3.00 4.5 kilos iron ore briquette added.
3.10 Bath stirred (to work in slag).
3.15 Samples taken. Steel No. 3. Slag No. 2.
3.17 30 kilos lime, 7 kilos roll scale, 4.5 kilos briquettes added.
3.20 Stirred.
3.22 7 kilos scale charged. Bath stirred.
3.30 55 kilos lime added.
3.35 Sample taken. Steel sample No. 4.
3 40 Rabbled well to work in very stiff slag.
3.55 Sample taken. Steel No. 5.
3.58 Removing slag (3 min.) Slag sample No. 3 taken.
4.03 4 kilos slaked lime thrown in to gather up a small amount of remaining slag. Removed at 4.10.
4.13 Steel sample No. 6.
4.14 3 kilos Fe-Si added.
4.15 7 kilos retort carbon added.
4.16 Reduced current.
4.19 40 kilos desulphurizing slag mixture added.
4.23 5 kilos fluospar added to thin down the slag.
4.35 Rabbled. Slag fluid. Steel sample No. 7. Slag sample No. 4.
4.37 7 kilos slag mix, and 6 kilos Fe-Si added.
4.42 Rabbling. Weight of furnace and contents at this stage, 21,050 kilos.
4.53 Kilos Fe-Mn added. Steel sample No. 8. Slag sample No. 5 taken 5.57.
5.05 to 5.10. Temperature tests.
5.18 Pouring. 1.5 kilos Fe-Si added to ladle.
Steel sample No. 9 and slag sample No. 6 from ladle.
Weight of furnace, 19,645 kilos. Metal poured, 1,405 kilos.

ANALYSES.

Slag Samples.

	No. 1.	No. 2.	No. 3.	No. 4.	No. 5.	No. 6.
Silica	16.11	11.28	6.51	20.72	19.40	26.72
Alumina	1.57	0.98	0.59	2.68	4.42	5.54
Ferrous oxide	12.43	17.51	16.78	1.05	1.12	0.93
Ferric oxide	10.73	12.59	9.71	...	...	...
Manganous oxide	16.89	11.90	5.52	0.18	0.50	0.74
Lime	34.57	37.93	55.01	63.60	63.53	55.40
Magnesia	4.13	3.44	3.84	3.47	3.88	5.21
Phos. pentoxide	3.16	3.39	1.24	0.055	0.078	0.023
Calcium sulphide	0.47	0.92	0.86	3.94	2.72	2.23
Loss on ignition	...	...	...	4.28	4.38	3.28
	100.00	99.94	100.06	99.97	100.02	100.07
Iron	17.33	22.43	19.84	0.82	0.87	0.72
Manganese	13.09	9.22	4.28	0.13	0.39	0.57
Phosphorus	1.38	1.48	0.55	0.024	0.034	0.010
Sulphur	0.21	0.41	0.38	1.73	1.21	0.99

Steel Samples.

	Carbon.	Silicon.	Sulphur.	Phosphorus.	Manganese.
No. 1	0.08	0.005	0.069	0.070	0.41
No. 2	0.05	0.007	0.070	0.039	0.29
No. 3	0.04	0.011	0.075	0.014	0.19
No. 4	0.03	0.055	0.745	0.012	0.14
No. 5	0.03	0.002	0.060	0.007	0.10
No. 6	0.03	0.003	0.061	0.005	0.11
No. 7	0.56	0.013	0.033	0.012	0.16
No. 8	0.62	0.159	0.013	0.019	0.51
No. 9	0.60	0.165	0.011	0.021	0.51

The above particulars show that the refining took 2 hours and 58 min. and used up 653 kw. hours.

The amount of refining materials used was:

Lime	109 kg. at $1.50 per 1,000 kg.	$0.16
Roll scale	29 kg. at 4.00 per 1,000 kg.	.116
Carbon	7 kg. at 5.00 per 1,000 kg.	.035
Fluospar	5 kg. at 5.00 per 1,000 kg.	.025
Slag mixture	47 kg. at 2.50 per 1,000 kg.	.117
Ferrosilicon	10.5 kg. at 62.00 per ton.	.651
Ferromanganese	3.0 kg. at 45.00 per ton.	.135
		$1.439

= 96c. per ton. Total weight of steel tapped, about 1,500 kg.

The above may seem costly, but at the Volkingen Works all the slag goes to the blast furnaces, so there is really very little loss, and consequently liberal use of these materials was made. Most of the lime was used to stiffen the slags in order to facilitate raking off. And again, the steel was produced in a small furnace, which is always more extravagant than a large one. Had this furnace been working at its rated capacity the refining material used would have been very

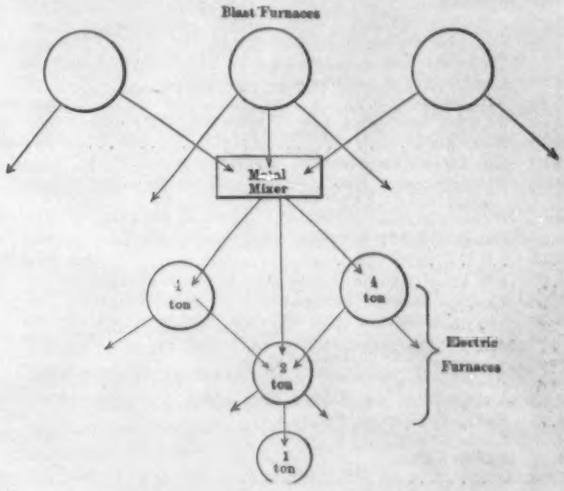


Fig. 4.—Arrangement of Electric Furnace Plant.

slightly increased, when the cost of refining material would have been decreased to about 75 cents per ton.

Costs.

Power, 653 kw.-hours per charge = 435 kw.-hours per ton, at 0.5 cent per kw.-hour	$2.175
Refining materials, $1.44 per charge per ton	.96
Labor, 3 men at say $3 per day, $9 production per ton, equals 4 charges at 1½ tons each = 6 tons	1.50
Lining costs, $52 for material and $20 for labor, $72; life, 12 days at 12 tons = 144 tons	.50
Repairs, say	.10
Total	$5.235

These costs look enormous, but, as before stated, the smallness of the furnace has to be taken into consideration, and here we have an estimate based on actual working for producing tool steel from molten basic Bessemer iron at a cost of only $5.25 per ton of ingots above the price of basic Bessemer ingots. This ought to appeal to tool steel manufacturers, especially as all grades of steel are produced, for the writer witnessed the production of all tempers of carbon steel, high speed, high silicon, nickel chrome, tungsten and other steels in this furnace, which had just been erected and was new to the men, so that better results may be expected at a later date.

An 8-Ton Combination Furnace

This was witnessed in active operation. Here again all grades of steel were being produced, but as the demand for alloy steels is not so great as that for carbon steels, the latter were predominant. Again, molten metal was generally used for the charge, and, as the production of high-grade steel was taking place with monotonous regularity, there was really nothing to excite one's enthusiasm. Just as soon as they broke away from molten metal for the whole charge, and used part metal and part scrap, readings were taken

and particulars followed up. These are given in the following tables:

Time.	Volts.	Amperes.	Kw.	Power factor.	Remarks.
12.15	4,000	138	440	0.79	Charged molten metal.
12.30	4,300	138	500	0.84	
12.45	4,300	138	500	0.84	
1.00	4,300	138	500	0.84	
1.15	4,200	140	500	0.85	
1.30	4,400	148	500	0.77	
1.45	4,620	156	600	0.85	
2.00	4,550	157	597	0.84	
2.15	4,500	160	595	0.83	
2.30	4,490	157	570	0.82	
2.45	4,500	160	580	0.81	
3.00	4,500	160	580	0.81	
3.15	4,500	160	580	0.81	
3.30	4,100	150	500	0.81	
3.45	3,900	141	455	0.83	
4.00	3,650	131	395	0.81	
4.15	3,570	123	355	0.81	
4.30	3,180	115	295	0.81	
4.45	3,180	115	295	0.81	
4.53	3,870	143	450	0.81	
5.00	3,870	143	450	0.81	
5.05	3,650	135	400	0.81	
5.15	3,650	135	400	0.81	Casting.

12.15 Charged molten Bessemer metal.....1st sample.
12.50 Charged portion cold scrap.
1.50 Charged final portion cold scrap.
2.30 All melted.....2d sample.
2.50 95 kilos lump lime and 50 kilos roll scale added.
3.00 Slag fluid.....3d sample.
3.10 160 kilos lime added to stiffen slag.
3.30 Removing slag. 45 kilos lime added to stiffen remaining slag.
4.00 Removing slag.
4.10 Charged 28 kilos carbon and 12 kilos Fe-Si.
4.15 .....4th sample.
4.20 100 kilos desulphurizing slag mixture charged.
4.25 10 kilos fluospar charged.
4.27 Stirred bath.
4.32 .....5th sample.
4.35 25 kilos Fe-Si thrown over slag.
4.38 Rabbled slag (brown color).
4.42 4 kilos Fe-Si and 4 kilos slag added.
4.45 Charged 45 kilos Fe-Mn.
4.50 Rabbled slag.
4.55 Rabbled slag.
5.00 .....6th sample.
5.15 Tapped.
15 kilos Fe-Si added to ladle when casting..7th sample.

APPROXIMATE AMOUNT OF STEEL, 6 TONS.

Fluxes, &c., used.	Kilos per charge.	Kilos per ton.		
Lime used (255 + 45)....	300	50	at $1.00 per ton	$0.05
Roll scale used.....	50	8⅓	at 2.50 per ton	0.021
Ferrosilicon (12 + 25 + 4 + 15).....	56	9⅓	at 66.00 per ton	0.616
Ferromanganese	45	7½	at 45.00 per ton	0.30
Desulphurizing slag mixture	104	17⅓	at 5.00 per ton	0.10
Fluospar	10	1⅔	at 5.00 per ton	0.009
Carbon	28	4⅔	at 5.00 per ton	0.023
				$1.12

The steel was desired low in carbon, phosphorus and sulphur, and on that account extra refining materials were used. Slag samples of this charge were not taken, as they are at best a matter of curiosity and cannot give any definite information, as most of the lime is used for mopping purposes only.

On referring to the time table and purification curve, it will be seen that the phosphorus was at its lowest just as soon as the cold metal was melted. The process of desulphurizing was carried on for another 1½ hours, thereby consuming 800 kw. hours, together with a large quantity of lime and roll scale. The extra cost of these materials amounted to 6½ cents per ton, and the labor would be equivalent to about 20 cents per ton and power 66½ cents per ton, the total amounting to about 93 cents per ton. The lining would also have produced extra tonnage. This waste would not be allowed in this country, but considering that high grade steel is produced, for which a very high price is obtained, the extra cost per pound amounts to 0.04 cent, which is very little. This must not be regarded as the usual practice, but was due to a lack of care on the part of the workmen.

Not only did the extra oxidizing cost the 6½ cents for the lime and oxide, but on calculating it out it was found that the 28 lb. of ferrosilicon was required to take care of it, which is equivalent to 30 cents per ton, and the costs as previously given are really higher than they ought to be. The total amount of power consumed was 2400 kw. hours, equivalent to 400 kw. hours per ton, using part cold metal. The costs, then, on this material are as follows:

Refining materials.....	$1.12
Power, 400 kw.-hours, at 0.5 cent.....	2.00
Labor, three men $9, at 14 2-5 tons per turn.....	.62
Lining	.30
Total	$4.05

But it has been shown that as much as $1.23 was wasted on power, labor, &c., to which must be added another 7 cents waste on lining, making a total of $1.30 to be deducted; therefore the costs should be:

As observed.....	$4.05
Less waste.....	1.30
Cost should be.....	$2.75

In any case the figures given for a high-class steel are very good.

As has been pointed out very frequently, for the refining of molten basic Bessemer steel for electric steel rail quality the costs are very low, and attention is again directed to Dr. Kjellin's paper, where he goes into costs very thoroughly.

A 16-Ton Refining Furnace

The estimated costs of operation of a 16-ton furnace working on basic Bessemer steel, and refining to 0.03 to 0.035 per cent. S. and P., and 0.50 to 0.80 per cent. C., are in accordance with the following:

SUMMARY.

	Per ton.
Materials charged.....	$15.10
Power:	
Heating, refining and cooling.....	0.535
Wages:	
On furnace.....	0.115
On lining.....	0.011
Lining materials.....	0.054
Repairs	0.190
Total	$16.105

License, tools, amortization and interest omitted.

Materials Used.

Pounds.		
2,240	basic Bessemer metal.....	$14.00
42	burnt lime, $1.50.....	0.028
14	ferrosilicon, at $62 per ton.....	0.387
22	ferromanganese, at $45 per ton.....	0.442
2	fluospar, at $5 per ton.....	0.004
22	roll scale, at $4 per ton.....	0.004
11	crushed carbon, at $5 per ton.....	0.025
2,276	of metallic material.....	$14.890
68	loss of 3 per cent.	
2,208	yield, costing.....	14.89
2,240	will therefore cost.....	15.10

Power Consumption.

	Per ton.
For drying and baking:	
6,500 kw.-hours, at 0.5 cent per kw.-hour, $32.50, say 2,400 tons per lining.....	$0.015
For refining:	
100 kw.-hours per ton, at 0.5 cent.....	0.50
For cooling fan:	
40 kw. for driving fan, at 0.5 cent per unit.....	0.02
Total for power.....	$0.535

Wages Per 24 Hours.

2 melters, at $6 each.....	$12.00
10 laborers, cranemen, boys, &c., at $2.....	20.00
Total	$32.00
Wages, per ton.....	0.115
Lining:	
2 foremen, at $5.....	$10.00
8 laborers, at $2.....	16.00
Total per lining, 2,400 tons.....	$26.00
Therefore, labor on lining per ton.....	0.011
Lining materials:	
Based on figures from Volklingen records, where dolomite mixture costs $7 per ton, as against $6.50 per ton here.....	$0.054

These figures are based on continuous working and little or no loss of time between heats; 1 hour and 20 min. is allowed from tap to tap. There is no reason why this should not be done as a regular thing, for when working on rail steel in Volklingen on the 8-ton furnace this time was frequently reduced. What held them up chiefly was the fact that as they were de-

pendent on the Bessemer plant, they could only obtain metal when it did not interfere with the operation of the mills and on that account they were often waiting for metal. The figures in the following table given are from a run of 42 consecutive heats on the 8-ton furnace:

Basic Steel		Electro Steel					
P.	S.	C.	Mn.	Si.	P.	S.	Remarks.
0.049	0.061	1.01	0.33	0.15	0.020	0.022	For heating 4,994
0.059	0.065	1.04	0.33	0.18	0.012	0.024	kw. hours.
0.050	0.067	0.79	0.33	0.26	0.012	0.029	
0.060	0.069	0.16	0.33	0.015	Trc.	0.032	It was afterward
0.054	0.067	0.64	0.89	0.16	0.020	0.016	found that the
0.072	0.079	0.96	0.33	0.084	Trc.	0.014	lime was run-
0.067	0.067	0.51	0.83	0.15	0.026	0.018	ning high in sul-
0.048	0.059	1.20	0.33	0.12	0.015	0.020	phur, which
0.055	0.087	0.92	1.06	1.12	0.018	0.020	would account
0.059	0.079	0.23	0.47	0.019	0.012	0.055	for the erratic
0.053	0.071	0.57	0.87	0.24	0.018	0.029	results.
.052	.063	1.02	0.39	.18	.016	.018	
0.050	0.067	0.82	0.34	0.096	0.024	.016	
.058	.061	0.80	0.37	.054	.021	.020	Most of the high
.059	.065	0.93	0.40	0.16	.020	.018	sulphur steels
.043	.089	0.92	0.34	.070	.013	.024	are low in car-
.070	.075	0.18	0.40	.024	Trc.	.038	bon.
.072	.069	0.86	0.40	0.10	.023	.019	
.058	.081	0.62	0.96	0.16	.024	.020	
.060	.067	0.07	0.37	.028	Trc.	.059	
.056	.097	0.66	0.82	.066	.023	.032	
.089	.091	0.08	0.44	.024	.021	.030	
.076	.055	1.00	0.84	0.14	.010	.018	
.053	.123	0.10	0.40	.030	Trc.	.038	
.065	.079	0.93	0.87	0.11	.024	.020	
0.062	.071	1.01	0.84	0.19	.020	.024	
.078	.073	0.82	0.81	0.11	.025	.027	
.061	.067	0.88	0.31	0.25	.016	.032	
.051	.077	0.59	0.78	0.22	.019	.029	
.050	.059	1.06	0.75	0.20	.015	.024	
.035	.057	1.10	0.86	0.20	.013	0.20	
.060	.063	1.10	0.34	.047	.015	.022	
.065	.079	0.98	0.34	0.23	.012	.014	
.071	.048	1.02	0.34	0.22	.013	.018	
.052	.077	0.83	0.87	0.20	.019	.020	
.064	.061	0.92	0.84	0.16	.020	.014	
.063	.063	0.83	0.79	0.13	.014	.012	
.060	.055	0.92	0.37	0.17	.010	.020	
.068	.075	1.00	0.23	0.15	Trc.	.024	
.072	.079	1.08	0.28	0.22	Trc.	.016	
.053	.065	0.88	0.76	0.13	.012	.020	
.075	.071	0.30	0.76	0.22	.014	.029	

A Steel Corporation Pension Fund of $12,000,000

Chairman E. H. Gary of the United States Steel Corporation has made the following announcement of an important move the corporation has made in its comprehensive plans in the interest of its employees:

"The United States Steel Corporation has established a fund of $8,000,000 for pension purposes which, by agreement with Mr. Andrew Carnegie, will be consolidated with the $4,000,000 fund heretofore created by him. The aggregate amount will be known as 'the United States Steel and Carnegie Pension Fund,' and the net proceeds will be administered by a board of 12 trustees for the benefit of employees of all subsidiary companies of the United States Steel Corporation. Eight of the trustees have been appointed by the corporation and four by Mr. Carnegie."

The trustees named on behalf of the corporation are E. H. Gary, George W. Perkins, J. H. Reed, Andrew Squire, J. H. Hoyt, K. K. Knapp, R. C. Bolling and Frank D. Adams. The first three are directors of the Steel Corporation. The others are of the corporation's counsel or of the counsel of subsidiary companies. The trustees appointed by Mr. Carnegie are Charles L. Taylor, W. B. Dickson, Robert A. Frank and H. E. Tener, Jr., all of whom were connected with the old Carnegie Steel Company organization.

The details of the pension system have not yet been fully formulated. The Carnegie Steel Company has paid pensions from Mr. Carnegie's fund and the American Steel & Wire Company alone of the other subsidiaries has paid pensions under a system organized some years ago. It is expected that a basis for unifying all such benefits will be now worked out. Coming closely upon the publication last month of the Steel Corporation's system of accident compensation the announcement of a liberal pension provision will doubtless do much to stimulate action in these directions by other large employers of labor.

The Newark Foundrymen's Association

At the annual meeting of the Newark (N. J.) Foundrymen's Association, held May 4, the following officers were elected: President, Franklin Phillips, Hewes & Phillips Iron Works; vice-president, James Flockhart, Mahr & Flockhart Iron Foundry; secretary, Arthur E. Barlow, Barlow Foundry Company; treasurer, G. Hannay, Oscar Barnett Foundry Company. Executive Committee: Louis Sacks, Star Heel Plate Company; James Flockhart, S. M. Miller, Mecker Foundry Company; John Hewitt, Thomas Hewitt Sons Company, and Thomas Malcolm, Riverside Steel Casting Company.

Preceding the election of officers, the annual dinner of the association was held. In the absence of President J. E. Bernhard of the Thatcher Furnace Company, Louis Sacks presided. After the members had received the annual reports of the officers, Mr. Barlow told of the work that had been done in the foundry class which is just completing its first year at the Newark Technical School. He said that to induce foundry apprentices to join the class, the original examination had been waived for the benefit of the first students, but notwithstanding that fact only nine scholars out of an entry number of 26 are completing the course. These nine students have been making good progress, however, and are able to pass an excellent examination on elementary drafting, and such subjects as describing the melt capacity of a cupola of given dimensions, iron mixture, &c.

It is expected that there will be a larger class next fall, as the association members have pledged themselves to interest the apprentices in their shops in the school. On the suggestion of Mr. Barlow the association recommended that the Executive Committee arrange to have some one address the organization at its meeting on June 1 on the use of molding machines. It was decided to give the members the privilege of inviting their foundry foremen at that meeting to afford them the benefit of the discussion.

Niagara Water Power Limitation

A treaty has been signed by Great Britain and the United States in which provision is made for regulating the use of water for power purposes at Niagara Falls. By the terms of the treaty the Canadian side is to be permitted the use of 36,000 cu. ft. per second, while the New York side will be allowed to use 20,000 cu. ft. per second. The amount allotted to the Canadian side will make possible a much larger development than is now in use, but as the developing companies are permitted by the Canadian authorities, as well as by the United States authorities, to transmit and sell in the United States at least half of the power generated in Canada, the New York side is benefited by the Canadian development.

The 20,000 cu. ft. allotted to the power companies on the New York side will make it possible for the Niagara Falls Power Company and the Niagara Falls Hydraulic Power & Mfg. Company to perfect their developments as originally planned. It will also leave a small amount of water for use in Lockport, where one company has a development to effect which water is diverted from the Erie Canal. As considerable attention is paid to efficiency at Niagara, on both sides of the river, the water diverted may be expected to afford the highest possible results in power output.

Machinery and Tools in Hungary

Manufacturing Activity There and American Opportunity

BY CAPT. GODFREY L. CARDEN.

This contribution from Captain Carden of the United States Revenue Cutter Service continues the discussion of the building and use of machinery and machine tools in Austria-Hungary, begun in "Foreign Opportunities for American Machine Tools," which appeared in *The Iron Age* March 31, 1910. In the present article he emphasizes his belief that Hungary is an especially inviting field for American tool builders, based on his study of conditions there while a special agent for the Department of Commerce and Labor.

The demand for machine tools in Hungary is second only to the demand in Bohemia, and the Bohemian territory offers one of the best fields for the exploitation of American machine tools in all Austria-Hungary. In some respects Hungary is the best market in the dual monarchy for American products, for there is no country in all Europe where an American is made to feel more at home than in the land of Kossuth. The welcome accorded to ex-President Roosevelt on the occasion of his recent visit to Budapest is thoroughly Hungarian in its sincerity, for to the average native of Hungary the term "American" has a meaning both significant and far reaching. It is for these reasons advisable, when dealing with Hungarian firms, not to employ certain foreign languages. French is welcome and so also is English.

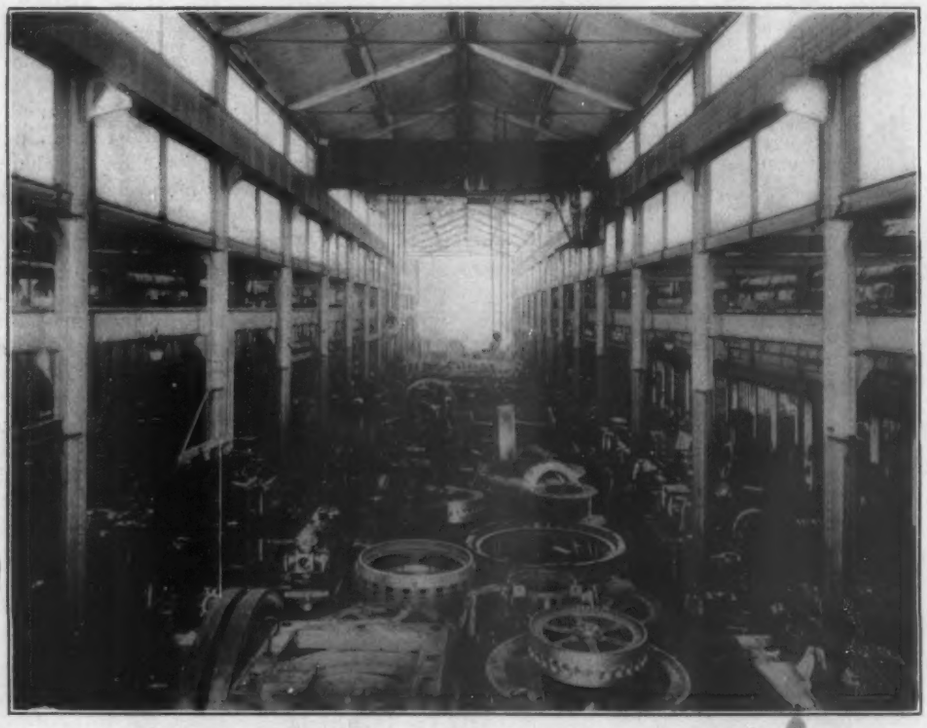


Fig. 1.—A View in the Erecting Shop of the Ganz Electrical Works at Budapest, Hungary.

Broadly speaking, there is no country in the world whose manufacturers are in better position to-day to do business in Hungary than those of the United States. The sentiment in Hungary is decidedly pro-American and permeates every walk and class of society. The fullest advantage of this situation can best be secured by sending Americans to Hungary to represent American products.

Budapest is the center of Hungarian manufacturing activity. It is a city of unusual charm. Humbolt, the geographer, declared that he had found in his travels that the three most beautiful cities in the world are Naples, Constantinople and Budapest. To the stranger there is just a faint suggestion in the Hungarian capital of an approaching Oriental atmosphere, but aside from this there is the unmistakable individuality of its people, which lends, especially to the American, the keen interest one experiences.

There are a number of manufacturing works outside of the Hungarian capital, but in Budapest proper the most prominent firms are the Ganz Electrical Works, the Budapest Locomotive Works and the Láng Engineering Works. In all three of these establishments the material turned out is high grade, and in the production of these outputs there are required machine tools possessing merit and economical features. There are many American machine tools in service at present in Hungary, but it is the writer's opinion that the full benefits of the Hungarian market are not being secured to American manufacturers. This statement is based on the representations made from the very best sources of information in that country.

The Ganz Electrical Works

Some of the best electrical equipment in all Europe is being produced by the Ganz Works. This plant is something more than a mere manufacturing establishment. It is really a great laboratory. When one speaks of Ganz there is immediately suggested the names of Bláthy, Déry and Zipernowsky. These men, all of whom have been connected with Ganz, are identified with some of the best work in electrical development in Europe. Fig. 1 is a view in the erecting shop.

The Ganz shops furnished the equipment in the noteworthy power installation at Manojlovatz, Dalmatia, shown in Fig. 2. This plant has a water head of 330 ft. and develops 24,000 hp. In the Manojlovatz installation 42-cycle, 6000-hp., three-phase generators are wound directly for 30,000 volts without any step up. The current is delivered in Sebenico, 20 miles away, where it is transformed down to 50 volts at one step. There is here presented a ratio transformation on the part of the 1500 k.v.a. transformers of 30,000 to 50. This Manojlovatz plant has been in operation for two and one-half years, and the reports are that it has given no trouble.

The Ganz Works was one of the first to interest

itself with marked success in the development of three-phase plants, and the development was carried on both in Hungary and abroad. Ganz is very much in evidence in Italy. Some of the most noteworthy of Italian power installations were undertaken by the Hungarian firm, particularly those for electric railroads. The three-phase traction system in northern Italy, known as the Valtellina line, was installed by Ganz. The initial equipment comprised 10 motor cars, each supplied with four 250-hp. motors, and nine locomotives. Ganz electric locomotives of the type illustrated in Fig. 3 are capable of developing 3000 hp., and it was Ganz type of motors which were loaned at the outset for service on the Simplon tunnel.

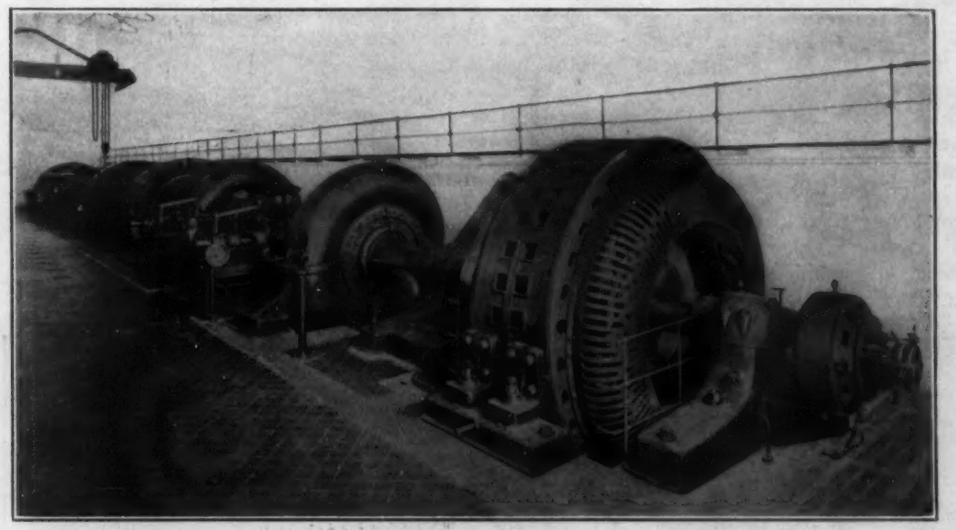


Fig. 2.—A View in the 24,000-Hp. Plant at Manojlovatz, Dalmatia, Equipped with Ganz Generators.

At the time the writer inspected the Ganz shops in 1909 there were about 1200 men at work in the machinery department. This force was to be augmented shortly to 1500, and the outlook was exceedingly promising, both for the increase of business and for further developments of the plant. The opinion prevailed there that in general American machine tools were unexcelled. There was criticism of certain tools, due, in the writer's opinion, largely to mistaken notions regarding the working capabilities of the machines, and this only emphasized what he repeatedly stated in the *Daily Consular and Trade Reports*, that it is necessary to send expert men to make clear the capabilities of American machines. Tools which are designed to operate at full efficiency in home shops will not show to advantage when run under the conditions frequently found in foreign installations. These facts can only be made clear by having expert toolmen demonstrate the work of the tool to the foreign shopmen. The latter are keen and anxious to learn, and no one is more welcome than the man who can take hold of a machine and demonstrate its full capabilities. Good demonstration work is much needed to-day to enhance the sale of American machine tools abroad.

The output of the Ganz shops comprises all kinds of electrical machinery, but it does not include telegraph and telephone apparatus. Among the noteworthy equipment turned out are turbo-dynamos, electric traction outfits, large transformers, controlling apparatus and arc lamps. Ganz has brought out many important devices, among which may be mentioned oil switches, lightning arresting features, an oscillograph, and dynamometric ampere and watt meters for research work.

The oscillograph, shown in Fig. 4, is of the electromagnetic type, the magnet being made in two halves, which are plate shaped, the pole pieces being arranged inside. Two very fine wires are spanned in the air gap, the currents to be observed being photographed passing them. The shadow of the wires is projected out through a hole drilled through the magnet body, the shadow tracing the curve to be taken, so that this instrument has no mirrors at all. It is adapted to the most accurate research work—namely, periodic lines less than 1-10000.

Ganz has brought out an arc lamp, Fig. 5, for alternating current, with carbons arranged at very great angles, and insuring an extremely short construction hight for long carbons. The electro-dynamometric watt meter, Fig. 6, designed by Ganz, is adapted for accurate research work for high amperages—that is to say, up to 500 amperes.

What has been said in the foregoing with reference to the Ganz Works will convey some idea of the very modern and up-to-date condition existing at this Hungarian plant. It would be possible to go into long details descriptive of equipment emanating from the Ganz shops, but to manufacturers of machine tools it should be apparent that here is a works where the essential requirement for tool equipment is machinery of the highest accuracy.

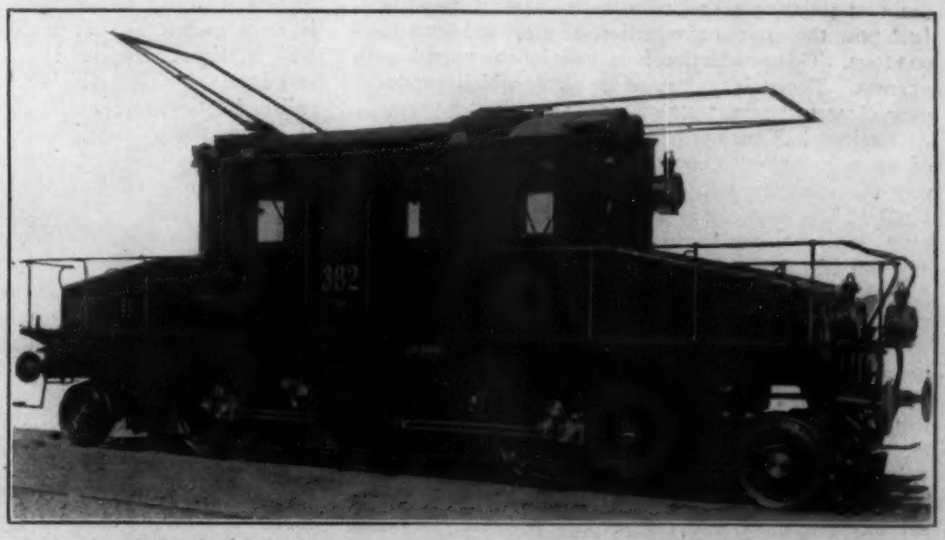


Fig. 3.—A 3000-Hp. Electric Locomotive Built by the Ganz Works.

Passing from Ganz to the Láng Engineering Works, the same general statements hold good, for nowhere in the dual monarchy is there better engine work found than at Láng's. The writer has reported at length on the Budapest Locomotive Works, and has expressed the opinion that the locomotives turned out from the Buda-

pest shops are unexcelled in Europe in point of finish and general appearance. This last is a very large establishment, and it is to be regretted that so very few American machine tools are to be found there. The same statement applies to Láng, yet at both of these shops American equipment should stand the very best chances for acceptance. Just now Herbert of Coventry, England, is having marked success in placing machine tools in the Budapest territory, and these are for the most part the highest grade of tools produced by that firm. What Herbert is doing can be done by our best American firms.

The Resicza Iron & Steel Works

Passing from Budapest to southeastern Hungary, one finds the great Resicza Iron & Steel Works. Resicza is to Hungary what Krupp is to Germany; the grade of steel turned out by this plant is regarded in many quarters as very nearly the best steel produced in Europe. Resicza was employing 6000 men at the time of the writer's visit to that plant in 1909, but the total force employed by the company which controls these works, in Hungarian territory alone, is 18,000. These

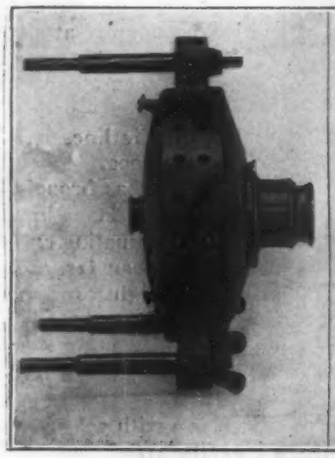


Fig. 4. — An Electro-Magnetic Oscillograph.

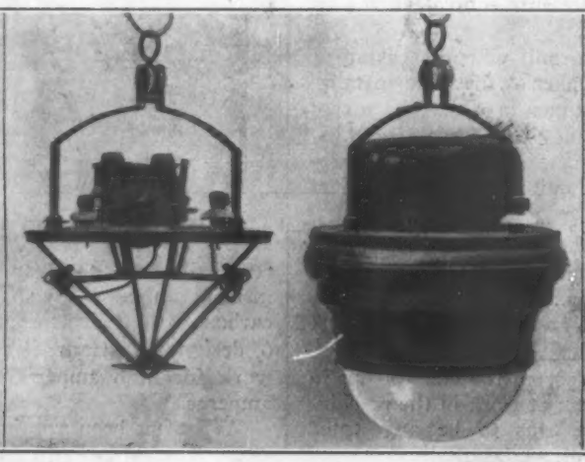


Fig. 5.—Interior Mechanism and Exterior of an Alternating Current Arc Light.

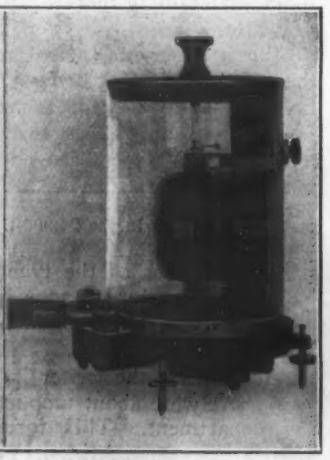


Fig. 6.—An Electro-Dynamometric Wattmeter.

Some of the Specialties Made by the Ganz Electrical Works.

works at Resicza are principally for steel making, but the manufacturing end of the business is important. Just now the annual production of steel is about 100,000 tons. This production is largely by the open hearth process. There is a Bessemer plant which produces very close to 25,000 tons of steel annually.

Resicza has an annual output capacity of raw iron of approximately 65,000 tons, but during the present year this capacity will probably exceed 110,000 tons annually. The iron ore is worked up at present in three blast furnaces, one having a capacity of 120 tons per day and two having a capacity of 70 tons each per day. A new blast furnace was in course of construction last year, designed by Julian Kennedy, Pittsburgh, Pa., which was to have a capacity of from 250 to 300 tons per day.

The rolling mills at Resicza for blooms, structural iron and heavy plate are driven by two sets of 2000-hp. electric motors, each through the medium of a flywheel (Ilgner system) capable of delivering a maximum of 10,000 hp. A steam engine of 4000 hp. is held in reserve. The electric drive permits reversing between maximum speeds in 8 sec. The largest roll in the blooming mill is 1 m. (39⅜ in.) in diameter, with a ratio of gears of one-to-two. The mills are all reversible from both sides of couplings.

Resicza is working a cheap plate mill with Ganz motors of 900 hp., 500 volts, three-phase. These motors are coupled directly to roll shafts and run at 50 rev. per min.

Resicza is producing practically all the steel tires required in Hungary. Other lines of manufacture include railroad bridges, ship and engine parts and field artillery. This firm has supplied stem and stern frames for ships built by Armstrong of England and Ansaldo of Genoa. The ordnance work observed at the time of the writer's visit was exclusively for Austria-Hungarian service and comprised mainly service field guns. Work of this character calls for the most accurate working machine tools, and it was evident that American makes were not reaching the Resicza Works in anything like the numbers one would expect to find.

The Limited Tool Building in Hungary

The only machine tools works of any importance in Hungary is a branch of the Vulcan Works of Vienna. State requirements make it necessary to utilize home products wherever possible on Government work, but this rule only applies where the work can be performed equally as well by tools of local construction. In the various reports made from Austria-Hungary territory, it will be seen that but two firms are capable of supplying this territory from the home standpoint. The only important machine tool works in the dual monarchy is Vulcan, and this plant with its shops in Vienna and Budapest caters almost exclusively to the building of heavy tools. Series work is but little known, and is only undertaken in the case of a few machines. This statement applies to such shops as Joh. Müller and Dania, both of which are located in Vienna. The railroad rates are exceedingly high, and it would seem as if the rates from Vienna to points in the dual monarchy are even greater than some of the through rates from foreign territory. These are features very much complained about by Austrian machine toolmakers, and is ascribed as one of the reasons for the lack of development of machine tool plants in Austria-Hungary. A firm like Vulcan, on the other hand, practically enjoys a subsidy, inasmuch as its outputs are heavy machines designed for the largest kind of work. Such tools cannot be built in series and involve a separate construction for each order. Vulcan tools are therefore found in practically all of the iron and steel works of Austria-Hungary and in the Skoda Works. Vulcan does not attempt to build the medium size machine tools, and it is in this latter class that American manufacturers will find their opportunities. It will be found that shipping rates from New York to Trieste and thence to Hungary or from New York to Bohemia will compare favorably with rates existing between many European points and the Austria-Hungary monarchy. At the present time the sale of American machine tools in this territory is almost exclusively in the hands of foreign houses. The writer did not observe an American agency anywhere in the dual monarchy, whereas instances exist of marked success being secured by Americans in other lines in this territory. The ma-

chine tool interests of the country are singularly prominent in having been turned over to foreign enterprises.

The outlook for business in Hungary for 1910 promises to far exceed the productions of recent years.

A Turbo-Fan for Ships

To supply forced draft to the boilers of the United States torpedo boat destroyers Sterrett and Perkins, eight steam-turbine driven fans are to be installed. The fans are of the Sirocco type, made by the American Blower Company, Troy, N. Y., and the turbines are 50-hp., seven-stage vertical machines, built by the Kerr Turbine Company, Wellsville, N. Y.

The turbines operate on a maximum steam pressure of 265 lb., and non-condensing against a back pressure of 5 lb. The units are placed to take air from the outside through funnels on the deck, and discharge it into the fire room through adjustable cone-shaped casings. Two fans each operating at 1655 rev. per min. deliver 40,000 cu. ft. of free air per minute into each engine room, maintaining therein a pressure equivalent to 4 in. of water.

Fig. 1 shows the turbo-fan unit with the casing of the fan omitted, that being a part of the fixed installation, and Fig. 2 shows the manner in which the turbo-fans are mounted. The turbines are made right and left pattern and are arranged in pairs, one pair delivering into each fire room. One unit is bolted directly on vertical stanchions on each side of the boiler.

From Fig. 2 it will be seen that a very limited space is available for the installation of the blowing set. Consequently a small diameter of the turbine was required. This is made possible without reducing the

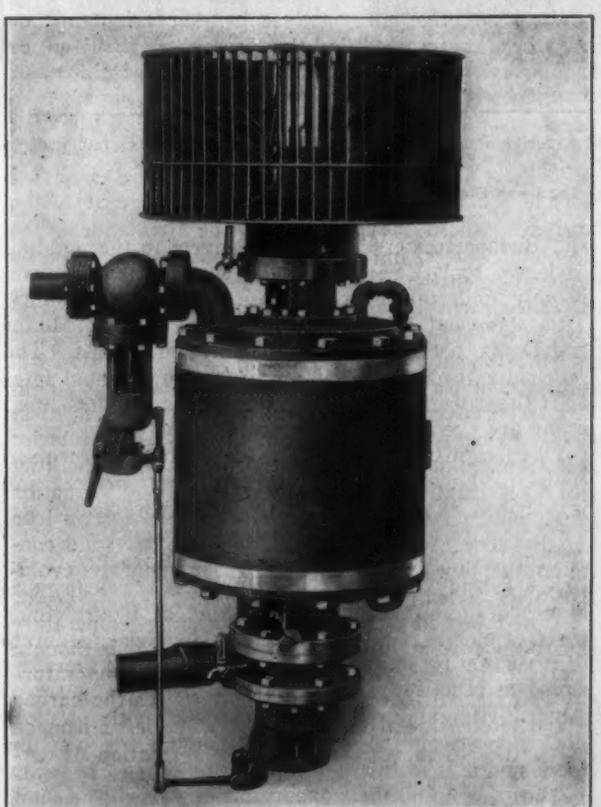


Fig. 1.—One of Eight Vertical Turbo-Fans for Supplying Forced Draft on Torpedo Boat Destroyers, Consisting of Kerr Turbines and Sirocco Fans.

power below the desired limit by using seven rotors, each 12 in. in diameter. The use of many stages with light rotors of small diameter is also of advantage in decreasing the trouble which comes from gyroscopic action, and is the more serious the larger the diameter of the rotors. It has been found that the gyroscopic action of heavy turbine wheels running in a horizontal plane and with bearings close together is enough to wear the bearings very rapidly, due to the heavy side pressure that exists when the boat rocks. By making the wheels so much smaller and placing the bearings a

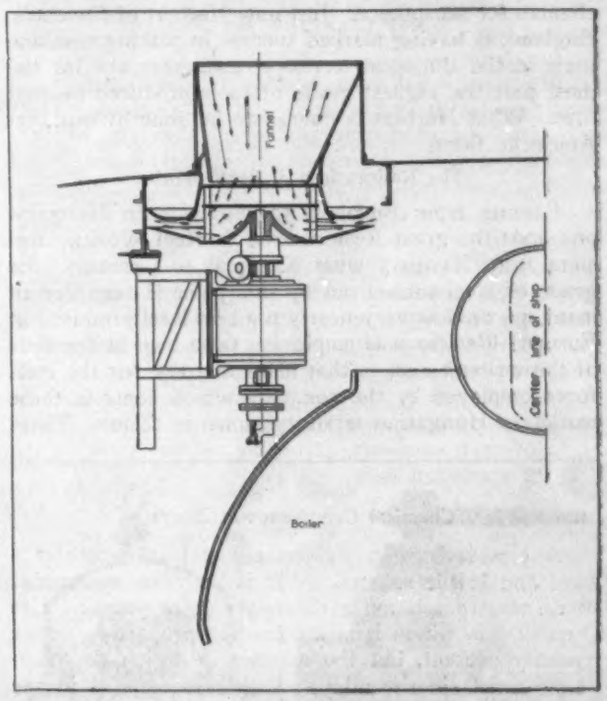


Fig. 2.—Sectional Elevation, Showing How the Turbo-Fans Are Installed.

considerable distance apart, as in these turbines, the effect of gyroscopic action is made practically negligible.

Apprenticeship Certificates

The Bantam Anti-Friction Company, Bantam, Conn., has favored us with a sample of the handsome lithographed apprenticeship certificate which is given to the boys who serve their full three and a half years in the company's shops. This certificate is 9 x 11 in., has the appearance of an official document, and is in such form that it can be framed. It bears on its face the fact that it is an "apprenticeship certificate," and a statement certifying that the boy named thereon "has duly served his full term as an apprentice in the machine shops of this company, and has had all instructions possible in the operation of lathes, milling machines, drills, shapers, grinders, tool making, bench work and other practice usually found in machine shop work. We can safely recommend him as a good, worthy machinist, reliable and conscientious in all of his work." It is signed by the works manager and the president. The company states that this certificate is found to be a very good incentive and something which the young men appreciate very much.

Undoubtedly the completion of the term of apprenticeship by a young man should be signalized by something more formal than simply a handshake and a verbal notice that he has served his time. A certificate of this kind is in the nature of a diploma and celebrates the event of a young man's freedom in an official manner. The practice is one which has been found highly productive of good results in several other establishments and is worthy of general adoption.

The Bethlehem Steel Company, at South Bethlehem, Pa., had four furnaces in blast May 1. The rebuilt furnace D went in blast April 7 and furnace B went out for relining and repairs April 2.

The Chemistry of Cast Iron*

Heat Treatment and the Influence of Chemical Compounds Upon the Casting

BY ELMER E. EAKINS, PENCOYD, PA.

Much work has been done in the last few years in investigating the influence of certain elements on the properties of cast iron and steel. Several workers have studied the formation of chemical compounds of iron with those elements which are usually associated with it in commercial varieties, with the result of establishing the existence of several well defined compounds having definite physical properties. It is now a well recognized fact that compounds are formed in alloys at definite temperatures. The result is that on cooling such an alloy the compound is decomposed into its constituents. In other cases the reverse condition takes place. It then naturally follows that the properties of such an alloy must vary with the conditions of such elements, according as they exist in the free or combined state.

Chemical Compounds in Alloys

A chemical compound in a metal is generally a hard and brittle substance. It is therefore reasonable to assume that it tends to impart those properties to the metal in which it is involved in proportion to the quantity present, but the manner in which the compound exists in the alloy, whether segregated in the free state, or in solution, or in a finely divided state, as in eutectic mixtures, modifies its influence on the whole mass. For example, take the case of the carbide of iron, Fe_3C. This carbide exists in iron in three ways, viz.:

1. In solid solution, termed martensite.
2. In segregated patches, as cementite.
3. In fine striations, as pearlite.

In solid solution, as in hardened steel and white cast iron, it exerts the maximum hardening effect, and in fine striations the minimum hardening effect. Also the maximum hardness is associated with the maximum brittleness.

In general, the chemical compounds of one metal with another do not follow the law of valency, so that they are of the type known as molecular, but the above law is obeyed in the compounds of nonmetals with iron. When the law of valency is strictly followed the combinations are of a stable character, and when it is not the compounds are easily decomposed, and the properties of the alloys will vary with the strength of the chemical combinations present. In the case of weak combinations the properties will vary much less from the properties of the components than in the case of strong combinations. The usual combinations of elements with iron in cast iron and steel are of the strong character, hence they are capable of profoundly modifying their properties.

In this paper only the usual elements found in cast iron and steel will be considered. These are carbon, silicon, phosphorus, sulphur and manganese. Of these, carbon, silicon, phosphorus and sulphur form chemical compounds with iron, but manganese does not. The latter, however, forms compounds with carbon, silicon, sulphur and phosphorus. Silicon forms compounds with sulphur, but not with carbon, at the temperature at which cast iron is produced. Sulphur unites with carbon to form a volatile compound.

As, therefore, several compounds can be formed in cast iron, it is reasonable to suppose that they play an important part in controlling the properties of the various grades of cast iron. If, therefore, we wish to arrive at a real notion of the nature and properties of commercial cast iron, a close study of the chemical compounds present must be pursued.

Casting Temperature and Blowholes

That the casting temperature has an influence on the formation of blowholes is generally recognized, but this is not the only cause. During the casting operation gases are absorbed. A partial decomposition of the moisture of the atmosphere always occurs, and the dissociated hydrogen combines with the flowing metal. Carbonic oxide is often formed by the union of carbon of the mold with the oxygen of any oxide in the metal; but this is only partly absorbed, most of it escaping as gas, and the rest is trapped in the metal as blowholes.

Iron does not form any strong combination with gases which are dissociated as soon as the temperature falls sufficiently to permit of their evolution. As long as the surface of the metal is liquid the gases will freely escape, but as soon as the crust of the metal is sufficiently thick to resist the pressure of the ascending gases they will be retained in the metal. As the whole process of evolution depends on the space available for the gases within the metal, or upon their passing through the metal, the freezing of the upper crust prevents any escape of the gas except by shrinkage and the formation of a pipe.

The three elements which play a most important part in preventing or modifying the blowholes are silicon, aluminum and manganese, all of which tend to increase the capacity of iron for excluding gases. As aluminum is not usually employed in cast iron, it is only necessary to consider the two others, although they are inferior to aluminum in the prevention of blowholes. The more the metal cools the stronger the tendency of the gases to escape, but this tendency may be counteracted by the presence of silicon or manganese. Conversely, in the absence of silicon or manganese the gases begin to escape at a higher temperature and are evolved during the cooling, so that blowholes result. When the whole of the metal is solid the gases can no longer form and are therefore kept in solution. The higher the percentage of silicon and manganese the greater will be the tendency to keep the gases in solution until a temperature is reached when the whole metal is solid.

If the metal is cast at an abnormally high temperature it will afford facilities for the evolution of gases and the formation of blowholes, since the interior will remain liquid a long time after the surface has solidified. The effect of sulphur and phosphorus is to lower the freezing point of the iron and keep the interior metal longer in the liquid state, thus causing facilities for the formation of gases, and, therefore, formation of blowholes. On the other hand, silicon causes iron to pass very rapidly from the liquid to the solid condition and thus in a great measure prevents the evolution of occluded gases.

It may be added that a too high casting temperature causes the formation of many blowholes. It is thought that the reason why excessively high temperature causes external blowholes is that it causes the carbon of the molten metal to react on the oxide of iron on the surface of the casting, with the formation of carbonic oxide gas.

Sources of Blowholes

Both gray and white cast iron evolve gas copiously on setting, but the white iron is more liable to blowholes than the gray iron. This is partly due to the fact that white iron passes through a pasty stage in solidifying, while gray iron passes quickly from the liquid to the solid state. Three sources of gas bubbles have been suggested:

1. The mechanical retention of air drawn into the metal while pouring.

* Read at the meeting of the Philadelphia Foundrymen's Association, May 4, 1910. Mr. Eakin is chemist of the open hearth department of the Pencoyd Works of the American Bridge Company.

2. The formation of carbonic oxide gas by chemical reaction.

3. The gasification of substances which have existed in a nongaseous state (solution, chemical union), and which had been formed by reaction, or acquired from the atmosphere or furnace gases.

Blowholes are probably due chiefly to hydrogen, nitrogen and carbonic oxide. The last may be formed by the superficial action of the carbon on the oxygen of the air, as it is much larger in the early than in the later escaping mold gases.

The presence of manganese and silicon in the iron, it has been stated, greatly assists in the prevention of blowholes. They appear to increase the solvent power of iron for gases, but they may also prevent the formation of carbonic oxide gas by being preferentially oxidized. In their absence the solvent power of iron diminishes and a greater number of blowholes result.

Segregation in Cast Iron

Segregation is a term applied to the more fusible parts of alloys and impure metals, which are the last to solidify, and are driven into certain local centers by that part which freezes first. Segregations are generally found near the upper part of the center of a casting and are more pronounced in large masses. Cast iron is a complex alloy containing carbides, silicides, phosphides, sulphides, &c., found in metallic iron. Consequently those having the lowest freezing points will tend to segregate from the iron and collect in the hottest parts of the castings, which will naturally be near the center, as this is the last portion to solidify. But it is not the extreme top of the casting which contains the most of the segregated compounds, as this is not the last to solidify. Other things being equal, the more rapidly the cooling the less will be the segregation, and as the rapidity of cooling depends largely upon the size of the castings, it follows that small castings are little liable to segregation. The proportion in which the segregating bodies are present will largely influence the result. The higher the proportion of impurities in the casting, the greater will be the amount of segregation.

Contraction

The contraction of cast iron on cooling varies with the proportions of the casting and the nature of the iron employed. When the constituents and the rate of cooling are such as to favor the production of combined carbon, the shrinkage is greater than when the opposite condition prevails. Therefore, white iron contracts more than gray iron on cooling.

The formation of a chemical compound is often accompanied by contraction, and a chemical compound in solution in a metal generally has the effect of closing up the grain when the compound does not exceed a certain amount. Therefore, the presence of carbide of iron, Fe_3C, in solution causes contraction of the whole mass, hence the greater shrinkage of white iron.

Manganese

Manganese has also the power of uniting with carbon to form a carbide of manganese, which dissolves in iron and which possesses the same general tendency as carbide of iron to close up the grain and therefore cause contraction. But if sulphur is present the manganese may unite with it to form sulphide of manganese, which segregates in different parts of the casting. In this case the manganese, although in chemical combination, has no influence on the condition of the carbon, so that the carbon might exist in the free form as graphite, in which case the contraction is due to the iron and elements other than manganese and sulphur. Now, while manganese carbide produces white iron with consequent much shrinkage, manganese may, as stated above, be present in quantity and produce neither chilling nor shrinkage, the iron behaving as though it were absent.

Phosphorus

Phosphorus is said to lessen the shrinkage of cast iron, but it is difficult to see how this can be the case since phosphide of iron, in the proportion usually present in cast iron, is positively stated by Stead to have no influence on the carbon, neither in causing combined carbon to be retained nor graphite to be set free. If, then, the condition of the carbon is the determining factor as regards shrinkage, it is evident that phosphorus can have no influence on the shrinkage. But phosphide of iron is in solution in iron at high temperatures, and if the iron is rapidly cooled it remains in solution. If, therefore, the effect of a chemical compound in solution is to close up the grain and cause contraction, phosphorus in that case promotes shrinkage. But with ordinary grades of iron the phosphide of iron is thrown out of solution and exists as a free phosphide. In that case, it probably has no effect on the contraction, except mechanically in enlarging the eutectic mixture and thus tending to neutralize the contracting effects of the carbide.

Sulphur

The effect of sulphur on cast iron depends to a great extent on the presence or absence of manganese. In the absence of manganese it unites with iron to form sulphide of iron, which is uniformly distributed through the mass when the amount of sulphur is under 0.08 per cent. According to Levy, the first freezing point of iron containing 1 per cent. of sulphur is 1187 degrees C., and with 4.3 per cent. carbon the eutectic mixture freezes at 118 degrees C., due to the iron sulphide forming a constituent of the eutectic. The iron sulphide seems to cement the otherwise discontinuous pearlite.

Now with low sulphur, which is the case in all iron castings, the pearlite and sulphide tend to coalesce with rounded mass. By the interposing of sulphide the pearlite is prevented from massing together, which is considered by Levy to be a preliminary to its decomposition into iron and graphite. He also suggests that the pressure of the iron sulphide prevents the expansion which accompanies the formation of iron and graphite from the decomposition of cementite. If, therefore, sulphide of iron is able mechanically to prevent the formation of graphite, the iron must be white, because the carbide is kept in solution in the iron, and as combined carbon increases the shrinkage, sulphur in iron (in the absence of manganese) promotes contraction during cooling.

Phosphorus in Steel Castings

In writing the specifications for steel castings, the most important point is to state that phosphorus shall not exceed 0.04 per cent. An excess of the other elements may be guarded against by requiring a certain ductility, but phosphorus is often masked by other factors and manifests itself only at a later time in that brittleness under shock which is its inherent characteristic. This is an important matter in the case of rolled metal, but it is of much more vital moment in steel castings, for these will generally fail, not by being pulled and stretched to destruction but by sudden strain and shock. The content of sulphur is of little importance to the user for it affects the cold properties very slightly, but it will do no harm to specify that it shall not be over 0.05 per cent., good castings usually containing less than this proportion. Copper need not be mentioned, for there is no evidence that it has any influence upon the finished casting.

Additions That Give Solidity

The elements used to procure solidity are silicon, manganese and aluminum. Their value to the steel-

maker is due in great measure to their power of uniting with oxygen.

3.44 parts of manganese unite with 1.00 part oxygen.
3.44 parts of aluminum unite with 3.01 parts oxygen.
3.44 parts of silicon unite with 3.93 parts oxygen.

Hence the aluminum is three times and the silicon four times as efficient as manganese, weight for weight, while they have an additional value from their greater affinity for oxygen, since this enables them to seize the last traces from the iron and wash the bath so much the cleaner. Another function which may play a part in the operation is the increase in capacity to dissolve or occlude gases, and as far as the value of the casting is concerned this will be equivalent to destroying them.

It is not known how far this determines the situation, but it is evident that it has no connection with the power to unite with oxygen. It was once thought that aluminum increased the fluidity of steel by lowering the point of fusion, but experiments with a Le Chatelier pyrometer gave the same melting point of 1475 degrees C. for ordinary soft steel as for an alloy with 5 per cent. aluminum. The tendency of both aluminum and silicon is to render the steel creamy and sluggish. It is true that such metal will run through small passages without chilling better than ordinary steel, but this is because the latter foams and froths when in contact with cold surfaces, and the flow is thereby impeded and sufficient surface exposed to chill the advance guard of the stream.

The amount of manganese should not exceed 0.70 per cent. in soft castings nor 0.80 per cent. in harder steels, since more may render the metal liable to crack under shock. Silicon can be present up to 0.10 per cent. in the mild steels and 0.35 per cent. in the hard without any appreciable diminution in the toughness. Aluminum is seldom present except in traces and should not be over 0.20 per cent., for it decreases the ductility. The carbon must vary according to the desired tensile strength and the use to which the casting is to be put. When it is over 0.70 per cent. the casting becomes so hard that machining is slow, and there is danger of lines of weakness from shrinkage in complicated shapes.

April Copper Production and Stocks

The Copper Producers' Association has issued the following statement of production and stocks:

	Pounds.
Stock of marketable copper of all kinds on hand at all points in the United States, April 1.....	123,824,874
Production of marketable copper in the United States from all domestic and foreign sources during April.....	117,477,639
Deliveries of marketable copper during April:	
For domestic consumption..... 67,985,951	
For export..... 31,332,403	
Total	99,318,354
Stock of marketable copper of all kinds on hand at all points in the United States, May 1.....	141,984,159

The increase in stocks in April was 18,159,285 lb., which is somewhat below the estimates made by the trade in the past week.

The plans of the Garry Iron & Steel Company, Cleveland, Ohio, for building a sheet mill at Youngstown, Ohio, which have been held up for special reasons, are now to be carried out. The company hopes to be at work soon on the building of the plant. Headquarters will be transferred from Cleveland to Youngstown, Ohio, about July 1. While specifications for engines, boilers, &c., are not yet ready, it is expected that they will be within 30 days.

The United States Light & Heating Company, general offices at 30 Church street, New York, announces the removal of its Chicago office from 745 Monadnock Building to 1013 People's Gas Building.

New Tools and Appliances

This is essentially a news department, information for which is invited.

A New Crusher for Raw Material.—The Williams Patent Crusher & Pulverizer Company, 545 Old Colony Building, Chicago, Ill., has recently placed on the market a new raw material grinder for tube mill feed. This latest addition to the line of Williams hammer mills is a universal grinder 60 in. in diameter, operating at 720 rev. per min. This machine is of especial interest to cement manufacturers desiring large units, and is equipped with an automatic feeder driven from the mill shaft, the grinding plate, adjustable hammers, a safety device or metal arrester to relieve the machine quickly of foreign material, special milled tool steel cage bars, absolutely uniform openings and other improvements. This grinder will take limestone, bluestone, shale, clay or coal in cubes of 1½ in. or less and deliver to the tube mill a product 95 per cent. of which will pass through a 20-mesh sieve without screens or separators. The hourly capacity of the machine is from 18 to 25 tons of raw material, depending upon the resistance of the substance to grinding.

A Transfer Press of the Arch Type.—A new line of transfer presses made in four sizes, ranging from 700 to 4200 lb., has been recently put on the market by the Standard Machinery Company, Providence, R. I. The machine is equipped with the Horton instantaneous friction clutch, and the transfer arrangement is operated by bevel gearing which transmits motion from the end of the crankshaft through a vertical shaft to a cam at its end. In this way a throw from 1 to 3 in. is obtained, and the cutting and drawing operations can be accomplished at one stroke of the press. A special feature in the feeding of the stock is an adjustable connecting rod in the feed mechanism, which is exceptionally advantageous in light work. With this arrangement it is possible to control absolutely the distance the plunger travels before the feed starts.

An Arch Press with Wedge Adjustment.—The Blake & Johnson Company, Waterbury, Conn., has brought out an arch press having a wedge adjustment in the nature of a double dovetail, which is said to do away with all lost motion in the gate and also permits the tools to be very readily adjusted by the operator, even though the press is in operation at the time. Seven sizes of press are built. Although designed for hand feeding, an automatic friction roll feed can be readily attached whenever desired.

Steam and Hot Water Boilers.—The Peerless Heater Company, Pittsburgh, Pa., has brought out a new line of patented sectional boilers for steam and hot water heating. One of the special features of these boilers is that the crown sheet is formed of cup-shaped semi-spherical arches, which, it is said, present to the direct heating action of the fire one and one-half times as much surface as if this feature were not employed, and this is done without adding to the water in the boiler. The water tubes in the larger types of boilers are shaped like the letter S, and are cast in one piece with the section. These start in the central part of the arched crown sheet and run into the leg on either side of the section. This feature of construction is unique, and it is stated provides as much prime heating surface as if these boilers had crown sheets double their actual size.

The New Era Metallic Packing.—The New Era Mfg. Company, Kalamazoo, Mich., has introduced a new type of metallic packing or self-lubricating bearing metal, which consists of a high-grade anti-friction alloy reduced to a spongelike form. The metal portions are of irregular and interrupted surface formation, and all surfaces throughout the spongelike mass are first treated with lubricating oils and then with flaked mineral lubricating substances. The main function of these oils is to cause the mineral lubricant to adhere to the surfaces of the metal; this is the commercial bulk form. For use as a

packing material this compound mass of metallic lubricant is formed into semi-compressed strips of convenient dimensions to wind around piston rods and valve stems for filling stuffing boxes. When intended for use as a bearing material it is compressed into the form of the bushings or bearings where it is to be used and becomes thereby a solid interlocked mass or body, which is said to be capable of withstanding the vibration and pressure to which bearing materials are subjected in service. Such bearings require no lubrication except that contained in the material, and are said to last several times as long as the best solid metal bearings.

A New Geared Head Turret Lathe.—The Whitcomb-Blaisdell Company, Worcester, Mass., has developed a new geared head turret lathe having a head that is very similar to the one with which its engine lathes are equipped. The head, it is stated, has been found useful on turret lathe work as it possesses the advantage of being able to change the speed of the work instantly. In this way it is quite a time saver in handling work that requires large facing and also small drilling.

A Combined Car Mortising and Boring Machine.—The Bentel & Margedant Company, Hamilton, Ohio, has recently added to its line of combination mortising and gaining and gaining and boring machines, a combined hollow chisel mortising and boring machine. This new machine has been developed as a result of the growing tendency to locate woodworking tools for heavy work so that two or more operations can be carried on at the same time, or at least consecutively, and is really a combination of two machines in one. The boring machine is of the maker's standard five-spindle type. The mortising attachment is of the vertical hollow chisel type and is designed for the heaviest character of work, taking chisels up to 2½ in. square. The ram is counterbalanced so that all of the weight is taken from the working mechanism, and is mounted in the front of the housing in dovetailed slides. This ram has a 17-in. vertical movement and a 16-in. transverse movement across the carriage, and will mortise 6 in. deep. Power is transmitted to the chisel ram and the boring spindles by a train of gearing and reverse friction pulleys, all of which are so placed as to be readily accessible for inspection and adjustment. The cutting speed of the chisel is 13 ft. per minute, and the return is made at twice that speed. The table which is common to both these machines is of steel beam construction, of very rigid character and will clamp material 20 in. wide by 16 in. thick.

A High Speed Friction Metal Saw.—In response to a general demand which has arisen for some method for cutting up steel sections and small bars quickly, Joseph T. Ryerson & Son, Chicago, Ill., has designed a high speed friction saw which is particularly adapted for this purpose. It is a remarkably simple machine, and has a capacity for cutting a 15-in. 80-lb. I-beam without turning the beam, and will do this work in from 28 to 38 seconds. The carriage of the machine is so arranged that small beams or other shapes can be cut at an angle when the work is held in place, but when straight cuts are being made no clamping is required. As no changes or adjustments of any kind are required in passing from one size or shape of material to another the machine may be used in rapid succession on various pieces. The saw is driven by a direct-connected 52-hp. motor, which is designed for operation on practically any of the standard voltages of either alternating or direct current.

An Oil Tank with Self-Measuring Pump.—For machine shop use the Haines Oil-Measuring Pump Company, Harrisburg, Pa., has built a dustproof oil tank of heavy galvanized sheet steel, which can be obtained in sizes having any of the capacities ordinarily required. The pump is of the self-measuring type, and is made of seamless brass tubing, with valves of the same material. In the small size one turn of the handle delivers ½ pint of oil at the nozzle, while in the large size a quart is delivered. No leather, rubber or other packing affected by oil is used in the construction of the pump, and all working parts are inclosed so as to exclude dust.

A New Dresser for Grinding Wheels.—The C. F. Stephan Specialty Company, Dayton, Ohio, has brought out a new dresser for grinding wheels consisting of a tapered tube filled with an abrasive. The material is not baked in position, but instead is first made as a stick of vitrefied material and afterward united to the holding tube by suitable metallic material, which holds it very firmly and thoroughly protects it against damage. The dresser is used in the regular way with the aid of a wooden handle inserted in the outer end of the tube.

Automatic Pinion Cutting Machine.—The Waltham Machine Works, makers of precision bench machinery, Newton and Cutter streets, Waltham, Mass., has brought out two sizes of machines for cutting the teeth of pinions and small gears. The smaller is intended for cutting watch and small clock pinions, which on account of the small size of the blanks and the accuracy and smoothness of the cut required, necessitates two and generally three cuts to complete the work. The arbor of this machine carries a saw, a roughing and a finishing cutter, and these each operate successively for one revolution of the blank when the machine stops for the insertion of a fresh blank. The other size of machine can take the three cuts at one setting and in addition is designed for cutting gears in a stack on an arbor or pinions with long staffs. Both machines are equipped with screw adjustments for aligning and regulating the depth of each cutter separately and a magazine feeding attachment that automatically ejects the cut pinion and replaces it with a fresh blank is also provided.

Bolt Threading Machines.—The Newton Machine Tool Works, Inc., Twenty-fourth and Vine streets, Philadelphia, Pa., has recently placed on the market a multiple automatic die head. This head was developed and thoroughly tested for over two years at one of the large locomotive building plants, and during that time was found to possess a number of advantages for a diversified class of work, such as is found in locomotive roundhouses, repair and erecting shops and other manufacturing plants, with the result that it has now been placed on the market. This head, which is claimed to be accurate, durable and flexible is constructed after an entirely new design. The head is flexible, inasmuch as it is fitted with chasers for threading four different sizes of bolts and at the same time retains the rigidity and accuracy of a solid die. Two sizes of heads are made, one with chasers for threading ⅝, ¾, ⅞ and 1 in. bolts, and the other for 1¼, 1½, 1¾ and 2 in. stock. The maker is building a double bolt threading machine equipped with heads of each size, and also single machines fitted with either one of the heads.

Automatic Machines for Turning and Drilling Clock Pinions.—The Davenport Machine Tool Company, New Bedford, Mass., has built two machines for turning and drilling the lantern pinions used in clocks. While this is the work for which they are primarily intended, the turning machine can be used for other kinds of pinions, such as are used in steam and pressure gauges, for mechanical toys and for handling any work of a similar nature where an unusual number of forming tools are required. The drilling machine bores holes in the pair of disks on the pinion shaft to receive the wires which make up the teeth when the pinion is completed, and is provided with an automatic chain conveyor for handling the work.

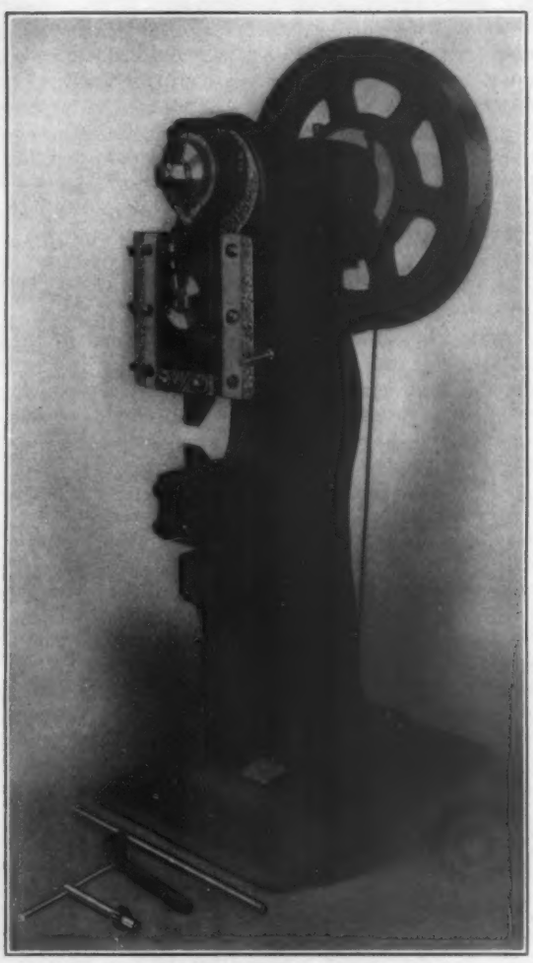
An Automatic Railway Spike Machine.—The Mechanical Equipment Company of Canada, 645 St. Lawrence boulevard, Montreal, Canada, has developed a new model of the Farrow patented automatic railway spike machine. Each part is driven independently from the main shaft, an arrangement which permits the machine being operated at a high speed. A friction drive is employed so that any jam between the header and the die will automatically stop the machine. The feed rolls are said to be the largest of any machine in operation and allow seven spikes to be cut per revolution of the rolls. The machine will make spikes from 4 to 7 in. long, from ⅝ to 1 in. square stock, with points from ⅝ to 2 in. long, and the average output of the machine is said to be from 12 to 14 tons per 10-hour day.

The New Standard Sprue Press

To meet the needs of brass founders and other manufacturers of soft metal castings, the Standard Machinery Company, 7 Beverly street, Providence, R. I., has brought out a redesigned sprue press, which is a modification of its standard style D power press.

As will be noticed from the accompanying illustration, it is furnished with a treadle and a hand lever. The cutters start automatically at the highest part of the stroke, so that the operator has both hands free to hold and guide the work.

The cutters are made of open hearth steel, 2 in. square, in cross section. This shape of stock was adopted because it does away with the necessity of



A Redesigned Press Built by the Standard Machinery Company, Providence, R. I., for Cutting Sprues from Brass and Soft Metal Castings.

expensive machine work in fitting, and the cutters can be set at right angles to the front of the press if it is found more convenient to do so. The cutters can be so adjusted as to be used up to the very last inch, and they may be set accurately to cut off the gate without touching each other, thus preserving the cutting edges. An eccentric adjustment is also provided. The machine is also fitted with a patented instantaneous clutch, which can be run either continuously or stopped instantaneously, at each stroke. The design of this clutch is such that it is stated there is less than 1-32 in. travel on the periphery of the flywheel after it engages or disengages, insuring a saving in power and a considerable reduction in loss, due to friction.

The general dimensions and specifications of the machine are as follows:

Net weight, lb	2,500
Weight of wheel, lb	500
Diameter of wheel, in	30
Face of wheel, in	4½
Overall hight, ft	6
Length of stroke, in	1¼
Distance between ways, in	7¾
Depth of throat, in	8
Floor space required, in	30 x 36

The frame is of extremely rigid construction and is so built as to get a large working space and to be convenient in handling the work. The overhanging construction of the frame permits large or irregular shaped castings to be operated upon.

The Philadelphia Foundrymen's Association

The regular monthly meeting of the Philadelphia Foundrymen's Association was held at the Manufacturers' Club in that city on the evening of May 4. Vice-President Elmer E. Brown presided. At the business session resolutions of regret were adopted on the recent death of Richard C. Oliphant of the Trenton Malleable Iron Company, Trenton, N. J. It was stated by the secretary that efforts would be made to arrange for a special car for the transportation of members of the association and others to the annual convention of the American Foundrymen's Association and the foundry exhibit at Detroit, June 7-10. Those who wish to join the party can obtain full information by addressing Howard Evans, secretary, Pier 45, North Wharves, Philadelphia.

The paper for the evening's discussion was on "The Influence of Certain Elements on the Properties of Iron and Steel," by Elmer E. Eakins, chemist of the American Bridge Company, open hearth department, Pencoyd, Pa. In Mr. Eakins' enforced absence the paper was read by Joseph S. Hibbs. Discussion followed by Alexander E. Outerbridge, Jr., George C. Davis and J. T. Merritt. Mr. Outerbridge stated that the paper treated the general subject admirably, but in reference to the hardening effect of manganese the writer spoke largely from a steelmaker's viewpoint. While manganese has a hardening effect, it has also what is apparently a softening effect in certain instances in connection with gray iron practice. Small additions of ferromanganese, he noted particularly, when made to a ladle of iron do not result in an increased percentage of manganese in the iron itself, but serve as a medium for the absorption of gases, besides causing changes in the condition of the carbon present in the metal, increasing materially the strength of the casting.

Screw Machine Attachments.—*The Iron Age* of April 28 gave a description of a milling attachment for screw machines made by the National Acme Mfg. Company, Cleveland, Ohio. This attachment was designed to mill flats on two sides of a part such as a radius stud. The company is now mailing to those likely to be interested a circular, a letter and a sample of work done on its machine, which involves the drilling of a hole and the facing of one side of the large end of a double ball ended lever about 1¼ in. long. The circular calls attention to the fact that the ball ends and taper shanks were formed and the large end faced and drilled in the time required for the forming alone. No extra time was required for the additional operations, and the performance of these in another machine is done away with. The letter calls attention to other similar pieces that can be handled entirely on an Acme automatic machine with the company's attachments.

The Pennsylvania Engineering Works, New Castle, Pa., has received an order for a number of steel ladles for the new plant of the Jones & Laughlin Steel Company, at Aliquippa, Pa., and also a contract from the Standard Steel Works for a 50-ton tilting open hearth furnace to be used in a foundry for making castings which is to be built at Burnham, Pa.

The International Harvester Company

The Annual Report for 1909 Shows a Heavy Gain

In *The Iron Age* of February 17, 1910, preliminary figures of the International Harvester Company's business for the calendar year 1909 were published. The detailed report, giving exact figures, has now been issued. The income account is as follows, compared with 1908:

	1909.	1908.
Total sales	$86,614,549	$72,541,771
*Manufacturing and distributing costs	67,669,234	59,615,222
Net	$18,945,315	$12,926,549
Miscellaneous income	869,767	524,598
Total income	$19,815,082	$13,451,147
Administrative and general expenses	589,753	520,769
Net income	$19,225,329	$12,930,378
Deductions:		
Appropriation for fire insurance	$250,000	$250,000
Appropriation for renewals and improvements	567,152	447,819
Pension fund	250,000	250,000
Depreciation and ore extinguishment	1,827,381	1,471,203
Contingent reserve	880,000	750,000
Interest	558,056	875,673
Total deductions	$4,332,589	$4,044,695
Net profits	14,892,740	8,885,683
Preferred dividends	4,200,000	4,200,000
Undivided profits	$10,692,740	$4,685,683
Previous surplus	16,691,989	12,006,306
Total surplus	$27,384,729	$16,691,989
Common stock dividends	$20,000,000	.....
Net surplus	$7,384,729	$16,691,989

*The item of cost of manufacturing and distributing includes the cost of manufacturing the products (exclusive of depreciation on plant, property and extinguishment), the freight and duty charges paid and all selling expenses incurred by the American company in marketing its products.

The following summary of sales illustrates the general development of the company's business, both in domestic and foreign trade:

Harvesting machinery, tillage implements and twine:	1909.	1908.
United States	$34,616,559	$30,920,337
Foreign	22,894,797	21,419,866
Total	$57,511,356	$52,340,203
Wagons, manure spreaders, gasoline engines, &c.:		
United States	$15,480,607	$10,903,616
Foreign	5,239,578	3,384,927
Total	$20,720,185	$14,299,588
Miscellaneous goods, steel products, fiber, &c.:		
Total	$8,383,008	$5,912,980

The comparison of working capital, at organization and at December 31, 1909, shows as follows:

The company commenced business with the following working capital:		
Cash stock subscription, 600 shares of $100 each, sold for cash at par		$60,000,000
Net current assets acquired at organization, consisting of trading inventories of raw materials, work in progress, and finished product, and sundry receivables, less liabilities and obligations assumed		15,805,495
Net working and trading assets at organization		$75,805,495
The working capital condition at the close of the last fiscal year, as reflected in the combined balance sheet at December 31, 1909, was:		
Current assets	$105,038,652	
Less current liabilities	14,215,281	
Net working and trading assets, December 31, 1909		$90,823,371
Net increase in working capital since organization.		$15,017,876

From President Cyrus H. McCormick's accompanying statement the following extracts are taken:

Sales were larger than any former year. Domestic trade increased 20 per cent. and foreign trade 13 per cent. over the previous year. The higher ratio of gain in domestic sales is principally because domestic trade suffered during the depression of 1908, which caused no decline in foreign trade.

Sales of harvesting machinery, tillage implements and twine increased approximately 10 per cent. over 1908, and were slightly larger than 1907, the previous high mark. Sales of new lines of wagons, manure spreaders, gasoline engines, cream separators, autobuggies and tractors aggregated 45 per cent. higher than any previous year and aided considerably the improvement in earnings.

At organization, October 1, 1902, the working capital was $75,805,000, compared with $90,823,000 December 31, 1909, an increase of $15,018,000. Cash expended for permanent property, additional plant, buildings and equipment, aggregating $22,000,000, has been meanwhile provided out of earnings.

Working capital requirements are large; first, on account of magnitude of inventories, the output of harvesting machinery being in process of manufacture for many months ahead of the selling seasons, limited to the time immediately preceding the harvests, and necessarily short; second, because of liberal credit to the farming community, enabling them to buy machinery for prompt use which otherwise they might not be in position to purchase.

Other Features of the Report

The report not only gives full financial details as to the company's condition, but also treats of other matters of interest not only to the stockholders but to the public. Information is given with regard to the relations of the company with the employees, the profit-sharing plans being set forth in detail, the bonus fund being explained, the employees' benefit association having its operations fully set forth, and details being given of general welfare work.

An unusual feature of an annual report is the incorporation of a large number of pages giving the location and description of properties, illustrating the types of the principal products and showing the location of agencies of the company. The domestic manufacturing plants are as follows: Akron Works, Akron, Ohio; Champion Works, Springfield, Ohio; Deering Works, Chicago; Keystone Works, Rock Falls, Ill.; McCormick Works, Chicago; Milwaukee Works, Milwaukee; Newark Valley Works, Newark Valley, N. Y.; Osborne Works, Auburn, N. Y.; Plano Works, West Pullman, Ill.; Weber Works, Auburn Park, Ill.; St. Paul Works, St. Paul, Minn. The foreign manufacturing plants are as follows: International Harvester Company of Canada, Ltd., Hamilton Works, Hamilton, Canada; Aktiebolaget International Harvester Company, Norrkoping Works, Norrkoping, Sweden; Compagnie Internationale des Machines Agricoles, Croix Works, Croix, France; International Harvester Company m. b. H., Neuss Works, Neuss, Germany; International Harvester Company in Russia, Lubertzy Works, Lubertzy, Russia. Views are shown of the Croix Works and the Neuss Works, each of which commenced operation in March, 1910.

A map is given showing the location of all the producing properties, including the blast furnaces and steel mills of the subsidiary Wisconsin Steel Company, the iron ore properties and coal lands of the same company, and the timber lands and sawmills of the subsidiary Wisconsin Lumber Company. The illustrations of the products of the company cover several pages and comprise a great variety of grain cutting and handling machines, hay machines, cultivators, wagons, cream separators, gasoline engines, portable engines, traction engines, auto-buggies, farm wagons, &c. Views are given of the interior of the Deering Works' club house, and illustrations are presented showing machinery safeguards which have been adopted in the factories. Views are presented of new agency warehouses in the United States and Canada, and handsome maps of different portions of the world are used to show the locations of the company's agencies, which are to be found all over the world. Another feature of the report is the presentation of charts showing graphically the relative production by countries and the relative values of the world's production of the five principal grains.

The Studebaker Bros. Mfg. Company, South Bend, Ind., contemplates a merit system among its employees whereby the worthy will be sent to technical schools for four-year courses, at the expense of the company.

CURRENT METAL PRICES.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from store—

Refined Iron:

1 to 17/4 in. round and square, 1½ to 4 in. x ⅜ to 1 in. ₩ lb 1.90¢
1½ to 4 in. x ¼ to 5-16 ₩ lb 2.10¢
Rods—⅜ and 11-16 round and square ₩ lb 2.10¢

Angles:	Cts ₩ lb
3 in. x ¼ in. and larger	2.10¢
3 in. x 3-16 in. and ⅛ in.	2.35¢
1½ to 2½ in. x ¼ in.	2.20¢
1½ to 2¾ in. x 3-16 in. and thicker	2.10¢
1 to 1¾ in. x 3-16 in.	2.20¢
1 to 1¼ x ⅛ in.	2.30¢
⅞ x ⅛ in.	2.40¢
¾ x ⅛ in.	2.50¢
⅝ x ⅛ in.	3.55¢
½ x 3-32 in.	4.35¢
Tees:	
1 in.	2.65¢
1¼ in.	2.45¢
1½ to 2½ x ¼ in.	2.15¢
1½ to 2½ x 3-16 in.	2.25¢
3 in. and larger	2.15¢
Beams	2.10¢
Channels, 3 in. and larger	2.10¢
Bands—1½ to 6 x 3-16 to No. 8	2.35¢
"Burden's Best" Iron, base price	3.15¢
Burden's "H. B. & S." Iron, base price	2.95¢
Norway Bars	3.60¢

Merchant Steel from Store—

	per lb
Bessemer Machinery	1.90¢
Toe Calk, Tire and Sleigh Shoe	2.50@3.00¢
Best Cast Steel, base price in small lots	7¢

Sheets from Store—

Black

	One Pass, C.R Soft Steel.	R. G. Cleaned.
No. 16	₩ lb 2.90¢	3.00¢
Nos. 18 to 21	₩ lb 2.95¢	3.10¢
Nos. 22 and 24	₩ lb 3.05¢	3.20¢
No. 26	₩ lb 3.10¢	3.30¢
No. 28	₩ lb 3.20¢	3.50¢

Russia, Planished, &c.

Genuine Russia, according to assortment, ₩ lb 12 @14½
Patent Planished, W. Dewees Wood, ₩ lb A, 10¢; B, 9¢ net

Galvanized.

Nos. 11 to 16 ₩ lb, 3.30¢
Nos. 22 to 24 ₩ lb, 3.55¢
No. 26 ₩ lb, 3.75¢
No. 28 ₩ lb, 4.10¢
No. 20 and lighter 36 inches wide, 25¢ higher.

Genuine Iron Sheets—

Galvanized.

Nos. 22 and 24 ₩ lb 5.75¢
No. 26 ₩ lb 6.25¢
No. 28 ₩ lb 7.25¢

Corrugated Roofing—

2½ in. corrugated.	Painted	Galvd.
No. 24 ₩ 100 sq. ft.	$3.85	4.80
No. 26 ₩ 100 sq. ft.	2.95	4.00
No. 28 ₩ 100 sq. ft.	2.60	3.75

Tin Plates—

American Charcoal Plates (per box.)

"A.A.A." Charcoal:
IC, 14 x 20 $6.35
IX, 14 x 20 7.60
A. Charcoal:
IC, 14 x 20 $5.40
IX, 14 x 20 6.50

American Coke Plates—Bessemer—
IC, 14 x 20.....107 lb $4.40
IX, 14 x 20 5.40

American Terne Plates—
IC, 20 x 28 with an 8 lb. coating $8.50
IX, 20 x 28 with an 8 lb. coating 10.50

Seamless Brass Tubes—

List November 13, 1908. Base price 18¢

Brass Tubes, Iron Pipe Sizes—

List November 13, 1908. Base price 18¢

Copper Tubes—

List November 13, 1908. Base price 22¢

Brazed Brass Tubes—

List August 1, 1908. 19½¢ ₩ lb

High Brass Rods—

List August 1, 1908. 14¾¢ ₩ lb

Roll and Sheet Brass—

List August 1, 1908. 14¾¢ ₩ lb

Brass Wire—

List August 1, 1908. 14¾¢ ₩ lb

Copper Wire—

Base Price, Carload lots mill 14¾¢

Copper Sheets—

Sheet Copper Hot Rolled, 16 oz (quantity lots) ₩ lb 18 ¢
Sheet Copper Cold Rolled, 1¢ ₩ lb advance over Hot Rolled.
Sheet Copper Polished 20 in. wide and under, 1¢ ₩ square foot
Sheet Copper Polished over 20 in. wide, 2¢ ₩ square foot.
Planished Copper, 1¢ ₩ square foot more than Polished.

METALS—

Tin—

Straits Pig ₩ lb 34¼@35¢

Copper—

Lake Ingot ₩ lb 14¾@15 ¢
Electrolytic ₩ lb 14¾@15 ¢
Casting ₩ lb 14½@14¾¢

Spelter—

Western ₩ lb 6½@6¾¢

Zinc.

No 9, base, casks... ₩ lb 8 ¢ | Open ₩ lb 8¼¢

Lead.

American Pig ₩ lb 5 @5¼¢
Bar ₩ lb 6¼@6½¢

Solder.

½ & ½, guaranteed ₩ lb 22¼@22½¢
No. 1 ₩ lb 18¾@19¼¢
Refined ₩ lb 17¼@17¾¢
Prices of Solder indicated by private brand vary according to composition.

Antimony—

Cookson ₩ lb ..@10¢
Halletts ..@10¢
Other Brands ..@9½¢

Bismuth—

Per lb $2.00@$2.25

Aluminum—

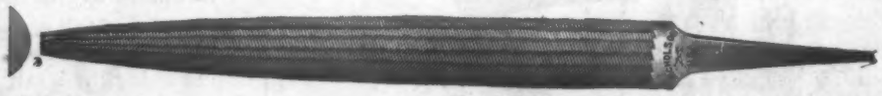
No. 1 Aluminum (guaranteed over 99% pure), in ingot for remelting 24¢
Rods & Wire Base Price 31¢
Sheets Base Price 33¢

Old Metals.

Dealers' Purchasing Prices Paid in New York

	Cents
Copper, Heavy cut and crucible	₩ lb 10.75@11.00
Copper, Heavy and Wire	₩ lb 10.50@10.75
Copper, Light and Bottoms	₩ lb 9.50@ 9.75
Brass, Heavy	₩ lb 7.00@ 7.50
Brass, Light	₩ lb 5.75@ 6.00
Heavy Machine Composition	₩ lb 9.75@10.00
Clean Brass Turnings	₩ lb 7.00@ 7.25
Composition Turnings	₩ lb 8.00@ 8.25
Lead, Heavy	₩ lb ....@ 3.00
Lead, Tea	₩ lb .. .@ 3.25
Zinc Scrap	₩ lb ....@ 3.75

NICHOLSON
U.S.A.
TRADE MARK



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